

Self-Review for 2006 Portfolio Review Expert Panel

Portfolio 2.2 Improved Quality of Life in Rural Areas

***Supporting Objective 2.2: Provide Science-
Based Technology, Products, and Information to
Facilitate informed Decisions Affecting the
Quality of life in Rural Areas***

***CSREES Goal 2: Support Increased Economic
Opportunities and Improved Quality of life in
Rural America***

For period 2000-2004



Executive Summary

Portfolio Results in Brief

Through the highly effective effort in this portfolio, CSREES produced the following long-term impacts on facilitating informed decisions affecting the quality of life in rural America:

- Increased knowledge, skills, and motivation to plan and take action to secure financial futures
- Identified relationships between economic stressors and family functioning
- Increased knowledge of social skills in individuals and families
- Identified best models for helping learners use new technology in cyber skills
- Increased knowledge, motivation and skills that promote healthy lifestyles and positive youth development
- Increased knowledge and implementation of farming practices for disabled farmers
- Increased knowledge in reducing injuries related to farm operations
- Generation of genetic tools for detecting human pests and zoonotic diseases as well as the development of risk assessment protocols and biocontainment measures
- Implemented practices to increase healthy homes, improve air quality, and conserve water and energy

Portfolio Review Methodology

The executive Office of Management and Budget (OMB) requires that all Agencies use the OMB Program Assessment Rating Tool (PART) to systematically examine and rate their efforts and ability to achieve stated objectives, goals, and missions. Agencies are also directed to conduct independent evaluations of their programs and report on these in the PART. Cooperative State Research, Education, Extension Service (CSREES) has responded to this directive by implementing the Portfolio Review Expert Panel (PREP). The Office of the Administrator convenes the panels of external experts, commissions self-review papers from relevant knowledge area managers, and receives the panel's report and recommendations. The self-review papers provide comprehensive yet concise insight into activities so that the expert panels may assess whether CSREES is fulfilling OMB's requirements for relevance, quality, and performance. The entire PREP is addressed to OMB's primary interest, the outcomes and impacts of agency work. This report specifically focuses on work supporting CSREES Strategic Objective 2.2: Provide science-based technology, products, and information to facilitate informed decisions affecting the quality of life in rural areas.

CSREES-sponsored research, education, and extension work is funded from multiple authorities and funding sources. To fully articulate this integrated, mission-related work, portfolios of

topically-linked issues are aligned with the five USDA Strategic Goals, and 14 CSREES Strategic Objectives. Portfolio 2.2 includes 11 related Knowledge Areas (KAs) integrating research, education, and extension. This portfolio is one of two self-review documents addressing Goal 2: Support increased economic opportunities and improved quality of life in rural America. It was prepared by National Program Leaders (NPLs) who are the knowledge area managers, as assisted by staff from the Office of Planning and Accountability (P&A). This portfolio and the related KAs demonstrate the capacity of integrated efforts of research, education, and extension to solve national problems and to ensure that the public investment is effective and efficient. The portfolio report includes detailed descriptions of activities in the relevant KAs in the 2000-2004 timeframe.

Portfolio Activities and Results

CSREES is engaged, through a unique partnership with agencies, states, institutions, and the private sector in solving problems affecting the quality of life in rural areas. The three central themes of this portfolio are Human Development and Societal Change, Health and the Environment, and Individual and Family Resources. In this time frame, vital work has been done to better equip families and youth with the skills they need to contribute to their communities. Examples include the 4-H technology and citizenship programs, family programs developed in collaboration with the Armed Forces, and the expansion of 4-H to military bases around the world. Innovations in technology will help rural communities bridge the “Digital Divide”; a Hybrid modem to improve high-speed Internet access offers promise in rural areas. Communications and disaster networking projects help community members learn to use cutting-edge technology to assess and respond to emergency situations. Work on farm safety includes working with youth to prevent farm accidents and assisting farmers with disabilities to continue to be productive. Research on fibers, fabrics, and protective clothing offers agricultural workers and emergency “first-responders” protection from chemicals or biotoxins. Innovative research on pests and Zoonotic diseases already has resulted in techniques to better track and predict vectors spreading disease.

The economic opportunities and quality of life enjoyed by residents and businesses in communities depend significantly on their capacity to take full advantage of the resources available to them, and to adjust to changing circumstances. The well-being and needs of communities and their residents vary widely. Poverty, lack of access to education and health care, and limited opportunity for high-wage employment differentially impacts specific groups of citizens. Disparities are found among communities across America in income, savings, education, housing, and other quality-of-life measures. In partnering with others, CSREES leveraged funds and implemented programs to extend the federal resources. The current analysis demonstrated that those programs have led to improving quality of life of Americans in rural areas as well as citizens in metro areas.

The programs described in this portfolio will continue to respond to current issues to remedy the challenges described in these KAs. Accomplishments are noted for years 2000-2004, but their direct and indirect results will continue on into the future. Additional human and financial

resources will be needed to generate new knowledge and implement better management strategies that lead to improving the quality of life in rural America as well the nation as a whole.

Future Portfolio Directions

From the portfolio analysis, we were able to identify emerging critical areas that need continued or new work. In addition, we took our cues from listening sessions with stakeholders, committees, national roadmaps, and national priorities. These include:

- Expansion of work applicable to low-wealth families including bankruptcy education
- Understanding of mechanisms to increase social acceptance of new technologies in food and agriculture
- Additive technologies for disabled farmers to increase their farming options and safety
- Enhancing models of service to aging and middle to late adulthood
- Generation of information technologies for local adaptation such as global positioning systems, geographic information systems and remote sensing
- Energy conservation in existing and new housing
- Leveraging resources to increase and improve programs supportive of positive youth development
- The generation of new tools for genetically identifying and the manipulation of pathogens as well as the development of risk assessment protocols and biocontainment
- Understanding the molecular interactions between vector hosts, pathogens, human and animal hosts

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Section II – Portfolio Discussion: Informed Decisions Affecting Quality of Life in Rural Areas

Portfolio Assessment Report

INTRODUCTION

This report reviews CSREES work addressing Portfolio 2.2, Informed Decisions Affecting Quality of Life in Rural Areas. In support of Portfolio 2.2, CSREES actively engages, through unique partnerships with agencies, states, institutions, and the private sector, in improving the quality of life and well-being of the American people in the areas of health, safety, biosecurity, resource management, technology and sociology, human development and family well-being, families and youth at risk, 4-H youth development, housing and indoor environments, and community planning and development. This review will illustrate state of the art knowledge and tools to effectively combat current and future challenges to quality of life of the people of this nation.

CSREES has five Strategic Goals which align with USDA's Strategic Goals and support the Agency vision that agriculture is a knowledge-based, global enterprise, sustained by the innovation of scientists and educators. CSREES' mission is to advance the knowledge of agriculture, the environment, human health and well being, and communities. Portfolio 2.2 – Informed Decisions Affecting Quality of Life in Rural America is related to USDA Strategic Goal 2:

Support Increased Economic Opportunities and Improved Quality of Life in Rural America

As stated in the CSREES Strategic Plan, the economic opportunities and quality of life enjoyed by residents and businesses in communities depend to a large extent on their capacity to take full advantage of the resources available to them, and to adjust to changing circumstances. The well-being and needs of communities and their residents vary widely. Disparities are found among communities and between specific population groups across America in income, savings, education, housing, and other quality-of-life measures.

CSREES promotes the well-being of Americans through research, extension, and education to better understand the economic, demographic, and environmental forces affecting regions and communities, and uses this knowledge to develop strategies that make maximum use of local assets. Through higher education, research, and extension, CSREES supports the education and training of residents and community and business leaders to help their communities thrive in the global economy.

Strategic Goal 2 is defined by two closely related strategic objectives:

Objective 2.1: Expand Economic Opportunities in Rural America by Bringing Scientific Insights into Economic and Business Decision Making

Objective 2.2: Provide Science-Based Technology, Products and Information to Facilitate Informed Decisions Affecting Quality of Life in Rural Areas

Strategic Objective 2.1, although inextricably related to Strategic Objective 2.2, is not the focus of this document; it is discussed in the Portfolio 2.1 self-review. This Portfolio 2.2 review is supplemented by evidentiary materials (available on site during the review) providing further information and documentation, including information on other portfolios, as needed.

Related to Strategic Objective 2.2, CSREES sponsors research, education, and extension to improve the understanding of socioeconomic conditions in rural America, and to promote community, youth and family well-being.

Portfolio 2.2: Informed Decisions Affecting Quality of Life in Rural Areas

Portfolio 2.2, as defined by the National Program Leaders (NPLs) that manage relevant programs, represents the efforts of CSREES to “facilitate informed decisions affecting individual, family, and community quality of life through the development of science-based technology, products, and information.” Programs in this portfolio focus on investments in new knowledge to understand how people can improve their well-being and quality of life while functioning in a family, community, regional, national, and global context. Three central themes and key areas include:

Human Development and Societal Change

- Technology and sociology – change and coping related to the impact of technological, demographic, and social transitions in society;
- Human development and family well-being – the social, cognitive, emotional, and physical development of children, youth, and adults throughout the lifecycle;
- Children, youth and families at-risk-equipping people with the skills they need to lead positive, productive, and contributing lives;
- 4-H youth development-providing opportunities for youth to develop skills and confidence for leadership and self-discipline;
- Community planning and development - to enhance quality of life and the understanding of problems, opportunities, and planning for renewal and growth.

Health and the Environment

- Housing and indoor environments - assisting consumers and professionals with issues related to housing affordability, healthy homes, sustainable housing, and indoor air quality;
- Health-immediate hazards to the health, safety, and biosecurity of people;
- Insects and other pests that are major disease vectors affecting humans;

- Zoonotic diseases and parasites affecting humans – parasites and animal diseases that pose potential threats to human health.
- Healthy lifestyles, health literacy, and community health planning

Individual and Family Resources

- Resource management – how people obtain and use resources of time, money, and human capital;
- Consumer economics – the demands, preferences, and behavioral responses and needs of consumers.

These three themes, in this portfolio are linked to related Knowledge Areas (KAs). A KA is a concept that links research, education, extension and integrated activities to strategic objectives. As expected with multi-disciplinary work, multiple KAs may be assigned to single projects. Every effort is made to report work in only one portfolio (and only one knowledge area), and to use cross-references to refer to related work. Projects are assigned knowledge areas codes by the Principal Investigators, and are linked to portfolios based on the reported percentage of effort (and expert knowledge by NPLs). KAs represent a vast number of activities. Priority programs and projects will be highlighted, below.

The **Knowledge Areas** classified under Portfolio 2.2, listed in numerical order, include:

- **KA 607: Consumer Economics**
- **KA 721: Insects and Other Pests Affecting Humans**
- **KA 722: Zoonotic Diseases Affecting Humans**
- **KA 723: Hazards to Human Health and Safety**
- **KA 801: Individual and Family Resource Management**
- **KA 802: Human Development and Family Well-Being**
- **KA 803: Sociological and Technological Change Affecting Individuals, Families, and Communities**
- **KA 804: Human Environmental Issues Concerning Apparel, Textiles and Residential and Commercial Structures**
- **KA 805: Community Institutions, Health, and Social Services**
- **KA 806: 4-H Youth Development (New Knowledge Area)**
- *813- Adult Aging and Development (Proposed Knowledge Area)*

Each of these Knowledge Areas is discussed more specifically in Section III of this report. KAs 607 and 801, and KAs 721 and 722, are presented as pairs, as these knowledge areas are closely related to one another. All other KAs will be presented individually. KA 813, is proposed to cover issues related to Adult Development and Aging to become part of the Classification System in the next iteration.

OVERVIEW

Improving Quality of Life in Rural Areas

Through USDA's "Growing a Nation" (www.agclassroom.org/gan/press_release.pdf) project, educators relay agricultural innovations, research, and inventions that have positively changed and influenced the lives of all Americans -- our culture, economy, and quality of life. USDA's work continues to address these issues along with the ongoing changes that affect America.

There are many challenges and opportunities related to improving quality of life. For example, over the last century, there has been a gradual decline in agricultural employment, due to mechanization. Population shifts are occurring across the country. In some locations young people are leaving rural areas, resulting in net out-migration while in other areas, older people are retiring to rural locations, which results in net in-migration and shifting patterns of land use. Family structure and family values are also changing. Many children live in single parent homes or with grandparents. Youth are facing a series of challenges to positive growth and development. The growing importance of technology in a competitive global economy requires increased levels of employment skills. Small business entrepreneurship and eCommerce offer hope for economic development, potentially permitting individuals, families, and communities to thrive in rural areas, enjoying the amenities of rural areas without suffering severe economic consequences.

Financial and social challenges confront many rural Americans. Financial planning, managing risks of loss, reducing household debt, and saving and investing to meet life goals are all essential yet may be neglected by individuals and families dealing with issues perceived to be more immediate and more pressing. In communities with limited savings and capital, development of human, financial, social, and 'built' capital (infrastructure) lags, compounding resource inequities over time.

As these dynamics create demands, stressors, and opportunities in rural areas, agriculture continues to be one of the most dangerous occupations in terms of illness, injury, and death. Addressing agricultural dangers and their impact on quality of life is a USDA priority. Exposure to chemicals, pests, Zoonotic diseases, and parasites imposes economic and social costs, and affects Americans' ability to lead safe and productive lives. Research on pests and Zoonotic diseases, safer agricultural practices and technology, development of new fibers and finishes, techniques for construction of protective clothing, and innovations in design and construction of housing and commercial structures can help protect people from environmental assaults, lessen damage to the natural and built environment, and reduce these social and economic costs.

CSREES, in collaboration with its partners, seeks to better prepare people to meet challenges and to increase opportunities for rural Americans so they are better able to make informed decisions that support their well-being. Research, education and extension activities funded by CSREES and managed by NPLs increase the possibility that Americans will share new knowledge and skills with others and with their communities, continuously improving their quality of life.

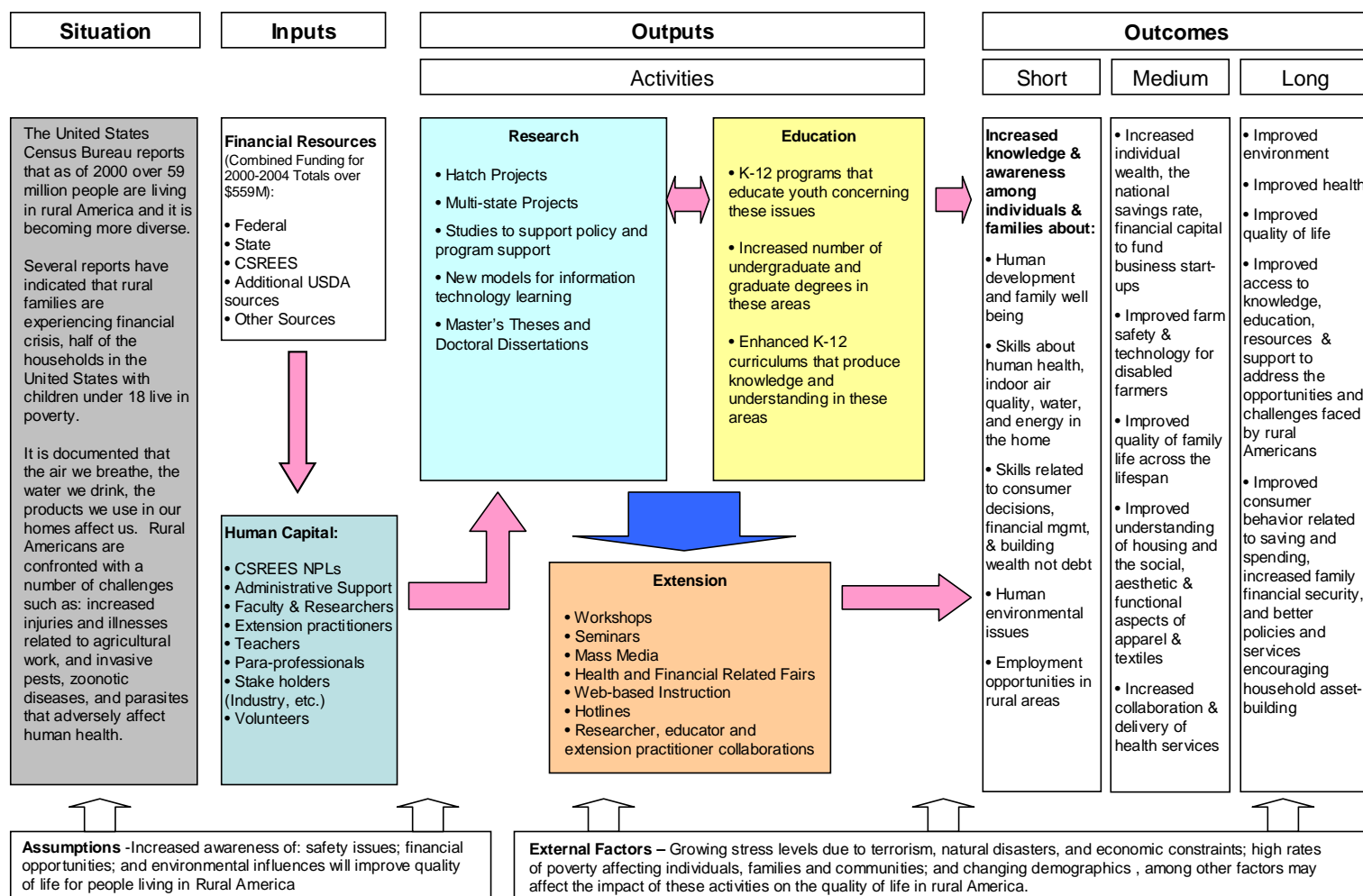
PORTFOLIO 2.2 GRAPHICS

Sections II and III of this self-review document have been structured following the format and using the components of the logic model. Logic models graphically explain the flow of work and create a framework for the explanatory text. (See p. 31-33 for details on logic models)

Section II uses the logic model as a framework to review the entire portfolio as a whole, while Section III uses it to provide detailed accounts of work in the KAs. The major themes in each of these KAs are depicted in the honeycomb graphics, which show the connections among these themes, highlighted examples of accomplishments, and areas for further research and development and applications of new knowledge. Related discussions of success stories and new directions for each major theme in each KA illuminate the honeycomb graphics.

Figure 3 – Portfolio 2.2 Logic Model

Portfolio 2.2: Informed Decisions Affecting Quality of Life in Rural Areas



SITUATION

The well-being of rural Americans depends on the social, environmental, and economic stability of communities; the physical and emotional health of residents; the effectiveness of local governance. The degree to which people can satisfy their basic needs, including food, clothing, housing, education, relationships, and health is an essential component of community well-being. The capacity of residents, families, and businesses to effectively manage their money, time, relationships, resources and human capital is another important element. The work of Portfolio 2.2 encompasses these topics and can be categorized into three broad areas: human development and societal change, health and the environment, and individual and family resources. Highlights drawn from each of these areas are presented below:

Human Development and Societal Change

- More than half of the U.S. rural workforce lacks adequate information technology skills required by the current job market.
- Working parents experience difficulties in finding a healthy balance between their jobs and family life.
- Rural youth may have less contact with adults due to long commutes to work and school; experience geographic isolation; have limited programs and opportunities; limited employment opportunities; and have less access to technology.
- Family caregiving issues, including child and eldercare, greatly impact earnings and quality of life, as well as workforce productivity.

Health and the Environment

- Agriculture is one of the most dangerous occupations in the U.S. in terms of illnesses and unintentional injury and death.
- Pests cost Americans billions of dollars and adversely impact quality of life.
- Zoonotic diseases and parasites which affect humans pose a severe threat to human health.
- Textiles, apparel, and housing offer protection against the environment and contribute to improved quality of life.
- People must be responsible for their own health-related practices as health care costs continue to rise.

Individual and Family Resources

Rural families are experiencing financial crisis due to changing economic structures and work force transitions, poor consumer decisions, inadequate savings, debt burden, and lack of planning for potential major life events. According to ERS's Rural America at a Glance, 2004:

- Non-metro counties make up the large majority of persistent poverty areas (340 of 386);
- 14 percent of non-metro households were below the poverty line in 2003;
- In 2004, 12 percent of non-metro households were food insecure;
- One in five rural children live in poverty and in households that are food insecure;
- Work productivity is being affected by a variety of family-related issues.

ASSUMPTIONS

- CSREES, through its partnership with the land-grant university system, has established solid networks to conduct comprehensive research, extension, and education programs to improve quality of life.
- Research, education, and extension programs relevant to the interdisciplinary work of Portfolio 2.2 provide science-based technology, products, and information to facilitate informed decisions implemented by people.

EXTERNAL FACTORS

Programs in this portfolio are helped or hindered in generating effective and meaningful impacts by a number of factors, including:

- Rapid and evolving changes in technology
- Disparities in resources among population groups
- Impeding and facilitating policies, politics, and economic conditions.
- Changes in community dynamics, the complexity of rapid and evolving changes in technology, and the extent of adaptation of rural communities.
- Changing demographics
- Growing stress levels due to terrorism, natural disasters, and economic constraints
- High rates of poverty affecting individuals, families and communities
- Increasing costs of health care, energy and housing

INPUTS

CSREES manages millions of dollars each year. The main investments in Strategic Objective 2.2 are used for leadership expertise and to support collaborative partnerships. While investment is significant, CSREES is not the largest contributor to national efforts. USDA and other funding sources are combined to maximize resources and sustain programmatic and research efforts.

Table 2 shows the total number of projects for each KA for FY 2000-FY 2004 as reported by the Current Research Information System (CRIS). These numbers primarily reflect research projects. Education and extension activities are not captured under CRIS. However, CSREES is currently establishing a database that will capture research, education, and extension, and integrated activities under one accessible and intelligible system.

Table 2: Number of Research Projects Reported in CRIS for each Knowledge Area during 2000-2004

Knowledge Area	Number of Projects
607 – Consumer Economics	471
721 – Insects and Other Pests Affecting Humans	428
722 – Zoonotic Diseases and Parasites Affecting Humans	265
723 – Hazards to Human Health and Safety	852
801 – Individual and Family Resource Management	353
802 – Human Development and Family Well-Being <i>(KA 806 4-H Youth Development and proposed KA 813 Adult Development and Aging projects are included here)</i>	886
803 – Sociological and Technological Change Affecting Individuals, Families, and Communities	1089
804 – Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	225
805 – Community Institutions, Health and Social Services	595
Total for all KAs	5651

Table 3, below, shows the total amount expended by CSREES by Knowledge Area by year from FY 2000-FY 2004. KA codes are assigned by Principal Investigators (PI) and verified by NPLs when projects are entered into the CRIS database. For projects linked to multiple KAs, funding is weighted by the percentage of effort assigned to each KA. Thus, the funding totals shown reflect unduplicated estimates of CSREES spending by KA.

Table 3: Total CSREES Funding by Knowledge Area for Portfolio 2.2 during 2000 – 2004

Knowledge Area	Fiscal Year (<i>in thousands</i>)					
	2000	2001	2002	2003	2004	Total
607	\$ 3,588	\$ 1,741	\$ 1,179	\$ 1,700	\$ 783	\$ 8,991
721	\$ 929	\$ 1,186	\$ 790	\$ 1,395	\$ 1,663	\$ 5,963
722	\$ 422	\$ 922	\$ 845	\$ 393	\$ 697	\$ 3,279
723	\$ 1,887	\$ 3,743	\$ 3,482	\$ 3,721	\$ 3,100	\$ 15,933
801	\$ 800	\$ 737	\$ 713	\$ 610	\$ 649	\$ 3,509
802/806	\$ 10,435	\$ 10,673	\$ 18,367	\$ 13,277	\$ 11,826	\$ 64,578
803	\$ 4,497	\$ 6,235	\$ 3,905	\$ 4,870	\$ 4,539	\$ 24,046
804	\$ 636	\$ 1,433	\$ 927	\$ 610	\$ 671	\$ 4,277
805	\$ 1,329	\$ 3,605	\$ 1,238	\$ 1,629	\$ 1,505	\$ 9,306
Total for all KAs	\$ 24,523	\$ 30,275	\$ 31,446	\$ 28,205	\$ 25,433	\$ 139,882

Nearly \$140 million of CSREES funding across the five-year review period was allocated for Portfolio 2.2 work. Human Development and Family Well-Being, KA 802, and 4-H Youth Development, KA 806, received over \$64 million for research, education and outreach to young people, families, and older adults in their local communities. The most significant funding is due to the sustained collaboration of local, state and federal partners related to the Children, Youth and Families at Risk (CYFAR) funding (\$41 million) and the Rural Youth Development funding (\$13 million).

Technological and sociological change, KA 803, received over \$24 million in CSREES funding, due to the growing need to equip people with the knowledge necessary to use technology and to the increasing demand for information garnered and analyzed using technology. Job performance, farm productivity, farm and firm profitability, and community development may all be helped -- or hindered -- by comparative knowledge of advances in information technology and telecommunications.

Hazards to Human Health and Safety, KA 723, received almost \$16 million in this five year period, to address critical health and safety issues affecting farm and agricultural workers and to help address the needs of disabled workers. Research, education and extension activities associated with KA 723 serve to enhance health and safety awareness in the agricultural sector as well as promote assistive technology for disabled agriculturalists.

Targeted, specific program areas such as Insects and Other Pests Affecting Humans (KA 721) and Individual and Family Resource Management, KA 801, received much smaller sums of CSREES funding, just over \$3 million for each area. CSREES funding in these KAs and the rest of the portfolio was leveraged by funding from other sources (see Section III for KA specific details on funding).

Table 4: CSREES Funding for Portfolio 2.2 by Source during 2000 – 2004 (excludes extension, Smith-Lever, etc.)

Funding Source	Fiscal Year (<i>in thousands</i>)					
	2000	2001	2002	2003	2004	Total
Hatch	\$ 6,294	\$ 6,741	\$ 6,449	\$ 6,756	\$ 6,302	\$ 32,542
McIntire-Stennis	\$ 197	\$ 161	\$ 175	\$ 185	\$ 191	\$ 909
Evans Allen	\$ 1,778	\$ 1,612	\$ 2,041	\$ 1,717	\$ 1,685	\$ 8,833
Animal Health	\$ 35	\$ 27	\$ 34	\$ 40	\$ 65	\$ 201
Special Grants	\$ 998	\$ 2,141	\$ 1,484	\$ 1,768	\$ 1,492	\$ 7,883
NRI Grants	\$ 1,400	\$ 2,344	\$ 2,259	\$ 2,552	\$ 2,127	\$ 10,682
SBIR Grants	\$ 348	\$ 467	\$ 1,252	\$ 520	\$ 1,217	\$ 3,804
CYFAR	\$ 9,000	\$ 8,481	\$ 8,481	\$ 8,426	\$ 7,538	\$ 41,926
RYD	\$ -	\$ -	\$ 8,000	\$ 2,981	\$ 2,667	\$ 13,648
Other CSREES	\$ 4,475	\$ 8,302	\$ 1,270	\$ 3,263	\$ 2,149	\$ 19,459
Total CSREES	\$24,525	\$30,276	\$31,445	\$28,208	\$25,433	\$ 139,887

-Totals may not match exactly to values in Table 5 due to rounding

As shown in Table 4, formula funds (Hatch, McIntire-Stennis, and Evans Allen) fluctuated over the period, but did not increase from year to year. On the other hand, funding for Special Grants, NRI grants SBIR grants, and “Other CSREES” all increased markedly between 2000 and 2004. Special grants increased from slightly less than \$1 million to almost \$8 million dollars, NRI grants from \$1.4 million to \$2.3 million, SBIR grants from \$.3 million to \$1.2 million, and “Other CSREES” from \$4.5 million to \$8.3 million.

On April 24, 2001 CSREES announced the release of a request for application (RFA) for a \$9.5 million competitive grant program under the Fund for Rural America to develop knowledge-based solutions for rural economic development. Top priorities included Harnessing Demographic Change to Increase Rural Opportunity and Rural Community Innovation. Communities need to understand the challenges of an aging population, the arrival of new immigrant populations, youth retention and workforce development. Communities must also develop the capacity to translate on- and off-farm innovations into economic growth and community revitalization. Innovations in value-added processing, e-commerce, distance learning, niche markets, and new industries can help rural communities share more fully in economic opportunities.

Table 5, below, shows CSREES funding as compared to other funding sources for work conducted in this portfolio. Data from other sources beyond CSREES are estimates and may not reflect exact or accurate levels of funding. On average, over this period, CSREES funding accounted for approximately 25% of total funding for projects related to Portfolio 2.2.

Table 5: Funding From All Sources for Portfolio 2.2 during 2000 – 2004

Funding Source	Fiscal Year* (<i>in thousands</i>)					
	2000	2001	2002	2003	2004	Total
CSREES	\$ 24,525	\$ 30,276	\$ 31,445	\$ 28,208	\$ 25,433	\$ 139,887
Other USDA	\$ 2,266	\$ 2,175	\$ 2,322	\$ 1,934	\$ 1,798	\$ 10,495
Other Federal	\$ 12,729	\$ 14,716	\$ 14,239	\$ 15,306	\$ 19,097	\$ 76,086
State Appropriations	\$ 27,967	\$ 31,565	\$ 37,894	\$ 37,486	\$ 37,506	\$ 172,418
Self Generated	\$ 4,671	\$ 16,183	\$ 18,740	\$ 18,175	\$ 16,882	\$ 74,651
Indep. Grant Agreement	\$ 14,020	\$ 3,521	\$ 14,907	\$ 14,910	\$ 17,121	\$ 64,479
Other Non-Federal	\$ 3,679	\$ 4,186	\$ 4,250	\$ 5,342	\$ 4,466	\$ 21,923
Total All Sources	\$ 89,857	\$102,621	\$123,797	\$121,361	\$122,303	\$ 559,939
CSREES as a % of the Total	27.3%	29.5%	25.4%	23.2%	20.8%	25.0%

*Totals may not match exactly to values in Table 4 due to rounding

Table 5 shows the amount and percentage of CSREES funding as compared to funding from all sources. Over the 2000-2004 period, CSREES contributed from 21 and 30 percent of the total allocated to programs in Portfolio 2.2, with the remainder coming from other sources. Every year, state appropriations alone exceeded CSREES funding. State appropriations were followed by funding from other federal agencies and self-generated income.

In 2000-2004, funding from other Federal Agencies increased significantly, in large part due to the addition of DOD funding for KA802 and KA806 military programs. CSREES funding levels may fluctuate over short intervals, as some awards may be two-year awards given in alternate years, or funding awards may have been delayed into a subsequent fiscal year. Self-generated funds, including 4-H Council contributions reflected in KA806, increased four-fold over their 2000 levels.

Knowledge Area 803 programs attracted several public private partnerships that resulted in in-kind contributions of more than \$40 million, exceeding the level of investment made by CSREES and States during the period.

CSREES Funds, Leads, and Manages Efforts and Funding

CSREES' NPLs manage a highly diverse portfolio of activities and efforts in Portfolio 2.2, Improving Rural Quality of Life in Rural Areas. Individual Programs and projects may be limited to research, education or extension, or include two or three of these areas. In Section III, each of these areas is discussed in the context of specific KAs. The following information provides an overview of significant outputs, and short-, medium-, and long-term outcomes of the efforts described in greater detail in Section III of the Portfolio 2.2 self-review.

OUTPUTS

Across All Three Identified Themes—Human Development and Societal Change, Health and the Environment, Individual and Family Resources

- Mission relevant-problems, opportunities, and issues requiring federal attention and support are identified by national program leaders and administrators.
- Stakeholder input and involvement is solicited and used in identifying emerging issues and setting priorities.
- Networks and collaborations with partners and stakeholders are created to support the on-going commitment to improving quality of life in rural areas.
- Programs and activities respond to existing or emerging problems, opportunities, and issues utilizing science-based knowledge.
- Methodologies are being developed to evaluate and assess the quality, outcomes, and impacts of these programs.

Human Development and Societal Change

- In a study of **Parental Relationships, Paternal Involvement, and the Well-Being of Children in Low-Income Families**, Cornell researchers gained an understanding of the characteristics associated with lower levels of parental involvement in children's lives.
- In 2001, the **National 4-H Strategic Plan** was developed. The plan addresses: 1) the power of youth, 2) access, equity and opportunity, 3) an extraordinary place to learn, 4) exceptional people, innovative practices and 5) effective organizational systems.
- In 2000, the **National 4-H Leadership Trust** was formed to exchange information among all 4-H partners. During 2002-2004, the Trust helped focus the national 4-H system on identifying and promoting action on the strategic plan and emerging issues across the 4-H system.
- **CYFERnet** created a cost effective, multi-university, human and technology network; peer reviewing and posting over 3,000 high quality resources; and serving 66,000 at-risk youth and families in over 200 community programs.
- Washington State Extension **Community Mapping Programs Using GIS and GPS Systems in Washington** conducted 3,600 social, economic and demographic analyses on behalf of community groups, social service organizations, state agencies, local/regional economic development organizations and private businesses to help rural areas do the research needed for community development.
- Connecticut's **Protecting Connecticut Water Resources** delivered water resource maps for Nonpoint Education for Municipal Officials (NEMO) to representatives from virtually all towns, with communities revising their comprehensive plans or taking other important public policy actions to better protect water resources. National leadership has resulted in training for NEMO starting up in 35 states.
- Seventy-one Cooperative Extension educators and small business owners participated in Farmington, New Mexico, in the first **National Rural E-Commerce Conference in 4-Corners to Help Trigger Rural Economic Recovery** April 12-16, 2004. Extension e-commerce educators from Arizona, Colorado, Minnesota, Mississippi, Nebraska, New Mexico, Ontario and Utah served as faculty; the New Mexico heads of SBA, RD-USDA

and Qwest participated. The 4-Corner model will be replicated in other parts of the nation. See the New Mexico e-commerce website www.nmtabcs.org.

- Information provided to families about positive family attitudes related to learning, literacy, and school behavior, helped children develop positive study habits, and enhanced the importance of parent involvement.
- In-depth workshops for childcare professionals focused on infant-toddler brain development, and instructed potential child care providers on state specific licensure requirements.
- Provided leadership in mandatory Army unit training, and awareness campaigns, and on violence in the workplace. Training was also given to civilians.
- Developed programs to provide in-home visitation, therapeutic support, and resource assistance to Army families with new babies and continuing support for families with children through the age of 5 years.
- Developed a resource network to provide technical assistance for child-care providers with information for individuals interested in entering the childcare business.

Health and the Environment

- Provided information to disabled farmers through literature, AgrAbility projects, website, meetings, and farm shows
- Educated health care professionals regarding AgrAbility and possible workplace modifications
- Developed safety curricula for farm groups and farm occupations
- Developed the National Land Grant Research and Extension Agenda for Agricultural Safety and Health, which helps more effectively use the land grant system's research and extension capacities to reduce injuries, illness, death, and property loss, and identified priorities for ag. experiment stations and Cooperative Extension Systems.
- Developed a youth farm safety certification curricula for students and trainers.
- Provided community based participatory programming on community health promotion for low literacy Hispanics and assessed needs through stakeholder inputs.
- Identified the genetic and physiological mechanisms of action in pests and diseases which are relevant to target sites that can be manipulated for pest control purposes (e.g., identify the glands that are sites for pheromone production in insect pests and understand how these glands are regulated).
- Researched and developed health budgets.

Individual and Family Resources

- Faculty representing 18 Land-grant universities met annually as the Family Economics Research Coordinating Committee (NCR-52) to share research methodology, and launch multi-state research projects on such topics as the effects of welfare reform on rural households.
- Seven Land-grant universities in the Great Plains Interactive Distance Education Alliance (GP-IDEA) launched a family financial planning master's degree and enrolled nearly 100 students.

- Extension Services in 42 States participated in revision and delivery of the NEFE® High School Financial Planning Program.
- The 4-H National Cooperative Curriculum System approved the programs of Financial Champions, Consumer Savvy, and Be-the-E (entrepreneur) to support youth financial skill development.
- Extension educators from 46 States and the District of Columbia participated in a roll-out conference of “Financial Security in Later Life,” a Cooperative Extension national initiative.
- About 250 community-based Extension educators working with the “Financial Security in Later Life” initiative increased their capacity to provide personal finance learning opportunities.
- Extension agents providing programming on fiscal responsibility to soldiers were able to reach over 80,000 individuals in 2002 helping new soldiers and families get started on the right foot financially and plan for the future.
- Extension in 12 States provided tax preparation assistance and financial education to low-income, working families.
- Twenty states either led or participated in a coalition to offer 31 local “Saves” campaigns.
- The multi-state research project “Family Business Viability in Economically Vulnerable Communities” (NE-167) examined the economic impact of family businesses and produced more than 100 refereed publications.
- The Oregon Poverty Dynamic Simulation model was developed as a result of the National Research Initiative-funded project “From Welfare to Work: The Effectiveness of Policy in Rural Labor Markets.”
- Land-grant faculty teams developed a toolkit of educational programs (e.g., Take the Road to Financial Security in Later Life, Critical Conversations About Long-term Care, Investing for Your Future, Planning for a Secure Retirement).
- Extension became a key partner with the “America Saves” campaign.

OUTCOMES

Short-Term

The following information provides an overview of some short-term outcomes of the efforts described in greater detail in Section III of Portfolio 2.2.

Across All Themes

- New research findings, new education programs or curricula, or new extension efforts.
- Grantees and partners increased knowledge, awareness, and skills.
- NPLs are connected to research, education, and extension activities nationwide.
- Programs and activities developed and applied science and knowledge.
- Methodologies were developed to evaluate and assess the quality, outcomes, and impacts of these programs.

- Publications
- Educational and marketing tools
- Improved practices
- New products
- Trained scholars and researchers
- Training programs

Human Development and Societal Change

- Iowa State Extension's **Strengthening Families Program** helped parents build positive attitudes and specific skills to nurture and guide their children from infancy through adolescence.
- **National 4-H Impact Assessment Project** (2001) results revealed that youth who participate in 4-H have a strong sense of belonging, feel emotionally and physically safe in these settings, and develop positive relationships with supportive, caring adults.
- Following the **4-Corners e-Commerce conference**, evaluations found that e-commerce training helped small rural farms/firms increase knowledge about improved business practices, expand use of extension educators for business advice, expand number of customers beyond local markets, and helped trainers adopt new educational products to keep rural small businesses aware of new developments in information technology.
- Discovered the association between high levels of social support and lower levels of depressive symptoms in low-income mothers.
- Evaluation findings reported that the majority of parents in a class on effective parenting said that they would monitor their children's homework efforts more and praise them for completion, eliminate distractions at home, and offer to help at school more in the future.
- A childcare provider education project increased the capacity of providers to deliver quality programming through monthly meetings where they receive training, discuss challenges, and work to create a collaborative service delivery system.

Health and the Environment

- Results of a study showed that a center for rural development has been involved in numerous activities that have increased access to resources for rural communities, thereby affecting the quality of life of persons in rural communities.
- Identified the role pests and diseases play in affecting human health and quality of life (e.g., childhood asthma, allergic reactions, and diseases);
- Identified the genetic and physiological mechanisms of action in pests and diseases which are relevant to target sites that can be manipulated for pest control purposes (e.g., identify the glands that are sites for pheromone production in insect pests and understand how these glands are regulated);

Individual and Family Resources

- Extension learners gained awareness, knowledge, and skills related to money management and informed consumer choice.
- Research on retirement and succession planning encouraged early communications on this topic by farm families. 80% of the 750 farm and ranch families involved in the Montana Estate Planning Program discussed estate planning with family members.
- Ninety percent of 36,563 individuals enrolled in one or more of eight “Financial Security in Later Life” programs increased knowledge, 62 percent planned to use recommended practices to save for retirement, and 48 percent planned to reduce debt.

Medium-Term

The following information provides an overview of some medium-term outcomes of the efforts described in greater detail in Section III of Portfolio 2.2.

Across All Themes

- Research findings were used to guide education and extension programs which in turn provided feedback from practical application or research on emerging needs from individuals, families, and communities.
- Research findings, through extension and education outreach, resulted in changes in practice by individuals and families
- Science-based information was delivered to decision makers
- Patents were received
- Research was applied to develop new products or processes.

Human Development and Societal Change

- Enrollment in and completion of 4-H projects contributed to leadership development, decision making skills, communication, and teaching responsibility. Skills learned in 4-H influenced participants in later life and career experiences; 78% of the alumni reported their experience in 4-H contributed to leadership development and 77% said it contributed to personal development (Radhakrishna, 2004).
- Over 65% of the CYFAR community programs have been sustained 6 years beyond CSREES funding. Extension Services report increased capacity to support community based programs for children, youth and families at risk. (Organizational Change Survey of 2005)
- **4-H Tech Wizards Project Leads Latino Youth into World of Information** Tech provided at-risk youth with an opportunity to access and develop basic computer skills, using the internet, web page design, digital video documentary, Lego Robotics, geospatial technologies, and other forms of information technology. Youths grades and graduation rates improved.
- A retrospective **study of 4-H alumni** who graduated from high school between 1999 and 2003, Fitzpatrick (2005) found that between 60 and 90 percent of

alumni reported learning life skills in 4-H such as accepting people who are different, community service, making healthy choices and job skills.

Health and the Environment

- Mothers who remained married over time and reported high levels of social support, lowest levels of depression, and developed outreach education efforts at the community level to enhance relationships and mental health over the long-term.
- Housing and indoor environments – assisted consumers and professionals with issues related to housing affordability, healthy homes, sustainable housing, and indoor air quality:
 - Tested 48,895 homes for radon, and of these, 6,536 were mitigated for radon
 - Corrected combustion appliance problems in 33,192 homes.
 - Corrected mold and mildew problems in 51,689 homes.
 - Took action to remove asthma triggers (carpets, etc.) in 7,358 homes
 - Tested 20,617 homes for lead and of these, 1,357 were abated for lead
- Developed and improved the methods of pest and disease control including the discovery of innovative treatments or preventives, through dissemination of information by workshops, meetings, and other communication media.
- Data and information were used by rural leaders as they considered the economic feasibility of primary health care services to determine what health service they could provide within their financial constraints.
- Educational materials on health care were developed from the expressed needs of a stakeholder group; collected data from agencies that provide services to Spanish speakers; and a pilot study was conducted on the usefulness of the resulting materials.
- Research finding lead to public clarification of the historical and cultural contexts of Indian nations when dealing with government agencies and/or commercial enterprises needing to store/dispose/treat radioactive waste materials.
- Successfully used pheromone to attract male cockroaches
- Tested termite bait & used to create a baiting system
- Developed more sensitive and specific diagnostics to detect GE and Lyme disease with protein antigens
- Established National Center for Biodefense Communications to increase emergency preparedness for the accidental or intentional introduction of pests, parasites, or Zoonotic diseases affecting humans by improving communications among Federal and local policymakers, healthcare professionals, and first-responder recipients in rural America.
- Improved knowledge and awareness of integrated and biologically-based pest management methods that are more compatible with the environment, and pose fewer risks to public health.
- Recruited, retained, graduated, and placed the next generation of research scientists, educators, and practitioners in pest control for public health.

- Evaluated protection provided by apparel to Ultraviolet radiation and pesticide exposure

Individual and Family Resources

- Sixteen students completed requirements for a masters degree in Family Financial Planning via the distance education program and three were certified as financial planners.
- Nearly 18,000 Extension learners enrolled as “American Savers” saved an estimated \$7,576,338.
- Missouri Extension helped 1,912 low-income tax filers in rural areas complete tax returns with 91 percent (1,736) receiving federal refunds (primarily the Earned Income Tax Credit) totaling \$1,953,916.

Long-Term

The following information provides an overview of some long-term direct and indirect outcomes expected to follow from the efforts described in greater detail in Section III of Portfolio 2.2. In general, not enough time has passed since the FY2000-FY2004 period to document outcomes anticipated to take place over a period of 10-15 years.

Human Development and Societal Change

- Increasing the proportion of healthy, well-functioning families.
- Increasing the number and proportion of healthy marriages and relationships.
- Decreasing rates of family violence.
- Decreasing rates of child abuse and neglect.
- Improving the social, mental and physical health of individuals and families.
- Youth gaining knowledge, skills, and behaviors for fulfilling lives.
- Communities showing improved social, environmental and economic conditions.
- Sustaining safe and supportive environments where youth can thrive
- Increasing resources for preventive care and care of the uninsured.
- Reducing expenditures on preventable diseases
- Community planning and development continuing for renewal and growth.

Health and the Environment

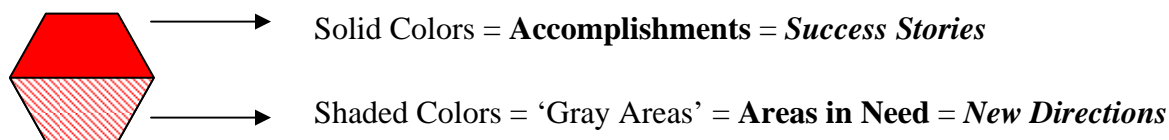
- Housing affordability increased, as a result of construction, manufacturing, and land use policies.
- Improved health & safety in the home.
- Improved environment as a result of cleaner air and reductions in exposure to radon, chemicals, mold and mildew, second-hand smoke.
- Improved health as a result of reductions in exposure to radon, chemicals, mold and mildew, second-hand smoke; improved health behaviors (diet, exercise, and smoking cessation).

- Provided health information to low literacy Spanish speakers and compared methods of nutrition and diabetes education for the maximum benefit to this audience.
- Under development are an impact of a new hospital on a rural community, and the impact of a federally qualified health center on a community. Impact analysis demonstrates the importance of the health services to a rural community.
- Provided assessment and in-service training to rural school system personnel to improve student performance. A follow-up study will assess impact.
- Hazards due to pests, Zoonotic diseases, and parasites to the health, safety, and biosecurity of people are reduced.
- Pheromone used to remove cockroaches from human habitats.
- Baiting system patented (Sentricon®) & used for early detection of termite activity.
- Surveillance detected WNV transmission event in Florida after hurricane Allison in 2001.
- Diagnostics allowed accurate detection of GE & Lyme disease.
- Provided reliable nationwide messaging to national health professionals.

Individual and Family Resources

- Sustained, cost-effective delivery of the Family Financial Planning distance education masters program.
- Increased household savings and wealth accumulation.
- Increased personal savings available to fund human capital investments (e.g. higher education, training) and small and home-based business start-ups.
- Improved financial management services addressing the needs of rural, minority, military, low-income, and other families.
- Improved self-confidence about money by youth learners, a positive, lifelong attribute.
- New and enhanced public policy, informed by research, to encourage and increase household asset development.

EXPLANATION OF THE FIGURE

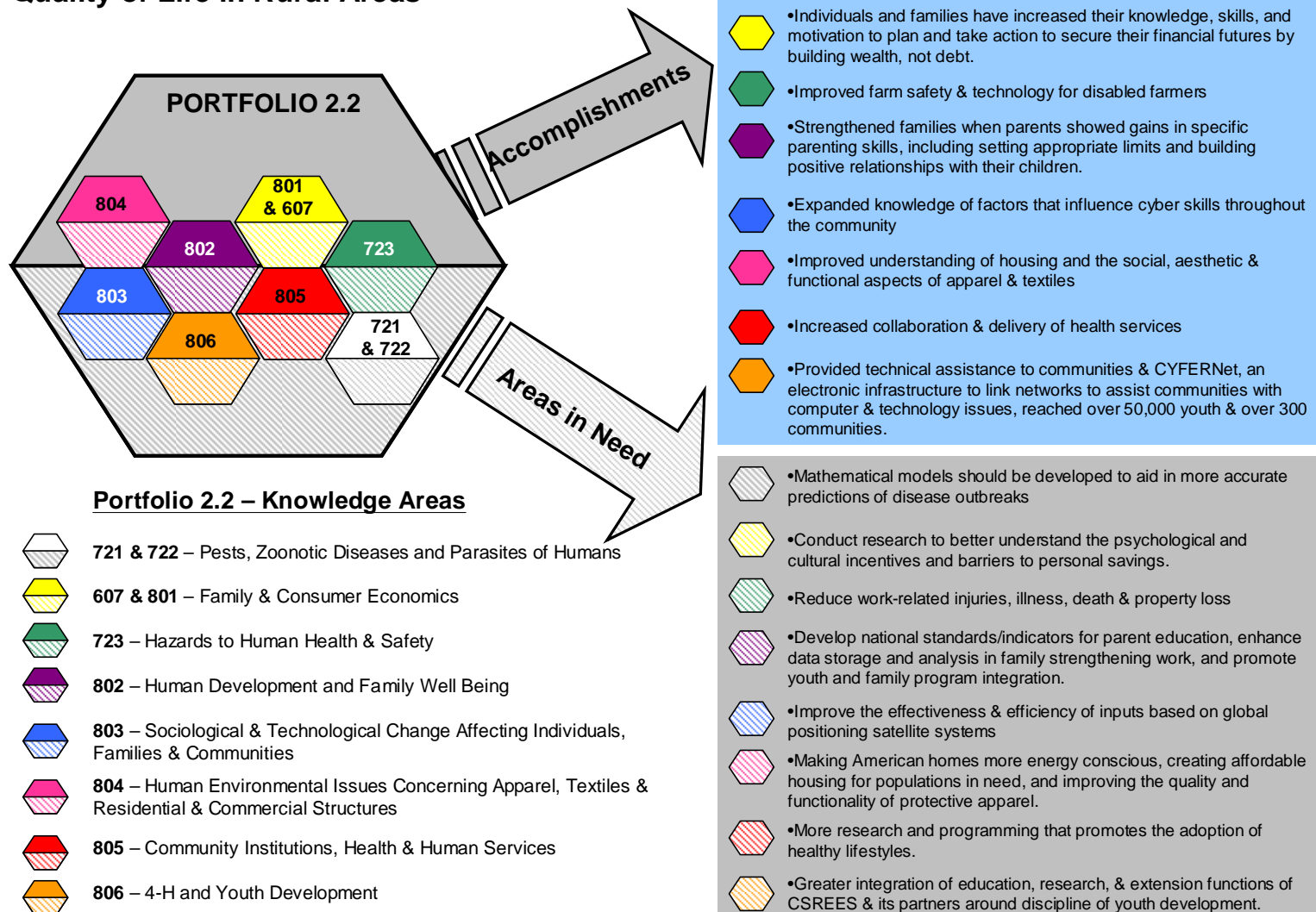


The honeycomb graphic is an attempt to summarize and simplify the complexity of the portfolio. The honeycomb figure is intended to represent a whole that can be subdivided into interrelated parts. The split in color indicates accomplishments (solid colors) and areas in need (shaded colors). Each honeycomb can be broken down into smaller and interrelated parts. Some examples are used to highlight the KAs in Section III. However, the complexity of the portfolio

presents several challenges to the development and interpretation of the graphic. As such, the size of the honeycomb is meant to show simply demonstrates that, together, the pieces reflect the primary areas of focus within the larger honeycomb and therefore take up the majority of the space. There are many relationships between programs both within and beyond this portfolio. Despite these caveats, this graphic is useful tool to demonstrate succinctly all of the parts and how they fit together to create the whole.

Figure 4 – Portfolio 2.2 Honeycomb

Portfolio 2.2: Informed Decisions Affecting Quality of Life in Rural Areas



SUCCESS STORIES

Section III will introduce a number of success stories and priority work relevant to the specific Knowledge Area discussions. Success stories below and those listed in Section III are by no means an all inclusive account of accomplishments in Portfolio 2.2 KAs, but provide some insight into a few exemplary projects that have been conducted over the reporting period. They have been selected particularly because of their strong resource base, their response to critical issues, and their illustrations of the Agency's integration commitments. Featured success stories include:

KA 607, 801

Financial Security Later in Life

Pg. 75

KA 721-722

Termite "fingerprints"

Pg. 99

KA 723

AgrAbility for Pennsylvanians

Pg. 111

KA 802

Building Strong Families (BSF)

Pg. 139

KA 803

Community Mapping Programs Using GIS and GPS Systems

Pg. 161

KA 804

Healthy Indoor Air for America's Homes

Pg. 190

KA 805

Rural Health Works

Pg. 225

KA 806

Youth as Resources for Strengthening Human and Social Capital in Rural Areas

Pg. 248

NEW DIRECTIONS

Section III also outlines areas in need of continued or future efforts. These recommendations, written by the National Program Leaders, derive from and include input from the executive branch, congress, stakeholders, department heads, research trends, and emerging issues. The following list some of the recommendations listed in Section III:

KA 607, 801

Pg. 79

Expanding work applicable to low-wealth families, including such programs as bankruptcy education, Get Checking, and Rural Taxpayer Education

KA 721-722**Pg. 99**

Significant advances have been made in basic and applied research on pests and zoonotic diseases affecting humans. However, the increased threat of spreading pests and diseases in the US (e.g., avian influenza) as a result of expanding trade and bioterrorism necessitates a greater investment in the areas of vaccine development, risk analysis and molecular diagnostics. As new technologies become developed, mechanisms must be developed to facilitate greater public acceptance of new products. CSREES needs to increase their role in disseminating critical information about these new technologies that would help rural communities become economically viable.

KA 723**Pg. 112**

Assistive technology for disabled farmers evolves with new product development time. New technologies make it possible for more farmers than ever to continue to farm safely and successfully with their disabilities. The AgrAbility program directors and staff are focusing a concerted effort on focuses on preventing secondary injuries, which may occur after and even as a result of the initial disability.

KA 802**Pg. 140**

Work in Adult Development and Aging is emerging in response to the impact of population aging on American society. This work focuses on research, education, and outreach to individuals, families, and communities, particularly in rural areas, who are preparing for or experiencing the impact of middle to late adulthood and the transitions associated with population aging in the United States.

KA 803**Pg. 171**

The next generation of information technology and telecommunications will focus on the mastery of geospatial technologies including global positioning systems, geographic information systems and remote sensing. Mastery of geospatial tools will be required in every sector of our rural society. Geospatial tools can improve the quality of decision making in all aspects of rural life, economic, social and environmental.

KA 804**Pg. 200**

Much progress has been made related to Human Environmental Issues Concerning Apparel, Textiles and Residential and Commercial Structures during the past decade. However, new challenges and needs must be addressed by this knowledge area in the future including energy conservation and use in new and existing housing for homebuilders and consumers committed to emphasizing sustainable natural resource use.

KA 805**Pg. 227**

Healthy Lifestyles or more appropriately, Healthy People...Healthy Communities is an emerging area that supports the expanding body of work around health education and promotion to increase health literacy.

KA 806**Pg. 253**

The success of 4-H Youth Development has been its ability to leverage resources, collaborate at the local, state, and federal levels to create safe and supportive environments for young people that continue to be sustained long after the funding period is over. The inclusion of KA 806: 4-H Youth Development reinforces the need for integration of the education, research and extension functions of CSREES and its partners around the discipline of youth development.

Other New Directions

- Overall-greater collaborative efforts and the expansion and funding of the eXtension Initiative will continue to improve access to information in support of quality of life and well-being across the nation.
- Safety-disaster preparedness will be incorporated into all programming.

Section III – Knowledge Area Discussions: Informed Decisions Affecting Quality of Life Portfolio

Portfolio Assessment Report

Knowledge Area 801: Individual and Family Resource Management (Family Economics) and Knowledge Area 607: Consumer Economics

OVERVIEW

Nearly a century ago, Mitchell (1912, 269) and Richards (1915, 140) observed the wise use of money was just as important as earning it. For the 21st century, understanding how consumer preferences affect business viability and how informed consumption decisions affect family financial security remains critical to prosperous rural communities.

Financial security, the ability to meet day-to-day obligations while planning and saving for the future, is a goal for most Americans. However, many individuals and families are experiencing financial crisis due to changing economic conditions, uninformed consumer decisions, inadequate savings, too much debt, poor risk management skills, and lack of planning for potential major life events, and unexpected events such as natural catastrophes.

While macro-economic and societal forces certainly place some individuals and families in economic peril, personal behaviors also influence significant asset development for households. Credit card debt is on the rise in the United States while the rate of personal savings as a percentage of disposable personal income is among the lowest of industrialized nations.

Additionally, there are too many households without checking or savings accounts or any other relationship with the formal financial services sector, which makes them vulnerable in times of acute need or crises. These households often are young, female, single parent, African American or Hispanic with limited educational attainment, low levels of homeownership, minimal net worth, and impaired credit histories. (See evidentiary materials)

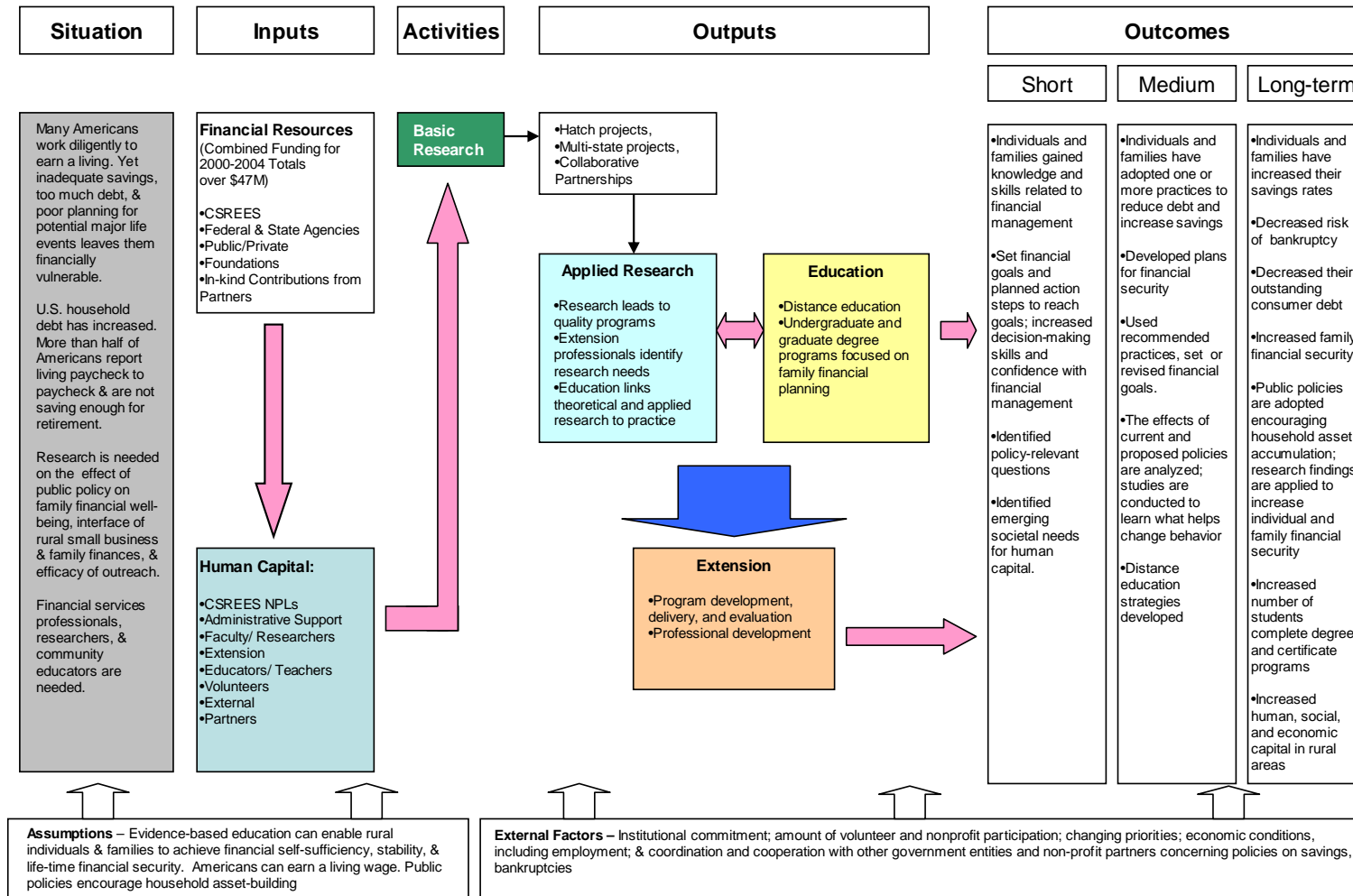
Knowledge Areas 801 and 607 were combined to reflect the focus on the individual as a consumer of goods and services, and manager of household resources. Research, education, and extension work in this area increases knowledge about how individuals and families obtain and use resources of time, money, and human capital to improve their quality of life. Knowledge is applied to:

1. Help individuals and families build wealth, not debt, leading to the achievement of goals (e.g. buy house, start business, fund education, secure a comfortable retirement);

2. Understand the economic impact of public issues, policies, and programs such as welfare reform on household well-being;
3. Identify the relationships between families and macro-economies (e.g. family-owned business, employer, community, nation); and
4. Show how consumer response affects market economies.

Figure 5 – KA 801 and 607 Logic Model

**Portfolio 2.2 – Informed Decisions Affecting Quality of Life in Rural Areas:
KA 801 Individual and Family Resource Management (Family Economics) and KA 607 Consumer Economics**



SITUATION

The objectives of Knowledge Areas 801 and 607 are to help emerging adults and welfare recipients transition to financial independence; to help vulnerable individuals and families improve financial stability, or the ability to meet day-to-day expenses; to encourage planning, savings, and investing to achieve lifelong financial security, and to understand how consumer choice affects household and business prosperity. These activities also are concerned with promoting science-based knowledge that expands our understanding of the macro-economic and society incentives and barriers to financial security and serve as a foundation for best practices in policy and practices of family resource management and consumer education. Further, these activities are concerned with promoting efforts and opportunities in higher education to prepare the next generation of scientists and service providers.

Saving is pivotal to household asset development. Research has repeatedly refuted the assumption that low-income, limited-resource people cannot save. There are "savers" and "spenders" in all income classes. While those with low or modest incomes cannot save as rapidly as the affluent, almost all have the ability to build wealth over time. Saving is important at all economic levels, and arguably even more so for low-income families who have fewer resources to withstand economic emergencies and shocks.

When a household controls consumer spending and manages risk, thus controlling debt, it can channel savings for potentially higher-yielding outcomes (e.g. healthy lifestyles; health, life and disability insurance to manage risk and protect assets, and stocks, bonds, and mutual funds) or into home and small business ownership. Buying a home increases assets, in most cases, and is a key contributor to community prosperity. Where home ownership flourishes, residents take more pride in their community, are more civic-minded, benefit from better school systems, and enjoy lower crime rates.

Household assets also increase as a result of investing in and growing a small business. Such businesses, which account for more than half of gross domestic product in the U.S. economy, are especially significant as a way for minority and rural households to accumulate wealth.

Extension targets programs for youth, low-wealth populations, and consumers making financial decisions throughout their lifetimes. It provides unbiased, research-based information and education via courses, Web-based curricula, and other educational outlets for people to acquire knowledge, skills, and motivation to build wealth, not debt. The emphasis of extension programs is on behavioral change to build personal wealth, obtain the skills to buy and maintain a home or start up a thriving business, optimize purchase decisions, avoid abusive lending practices, and plan for their long-term financial futures.

ASSUMPTIONS

It is assumed programs and policies, especially those reaching rural America, will build awareness, increase knowledge, motivate behavior change, and improve family financial well-

being. Aggregated behavior change will lead to improvement of indicators of economic health. Americans must be able to earn a living wage, thereby giving them an income to manage, and commit to the goal of achieving financial security for themselves and their families. Funding must remain secure for research, education, and extension work to achieve a scale of impact necessary for societal change. Research programs must provide effective risk management tools, and education and extension efforts must disseminate them.

EXTERNAL FACTORS

Factors include changing economic conditions; terrorism and natural disasters; changing priorities for Agency and stakeholder commitments; volunteer and non-profit commitment, and coordination with other government agencies at federal and state levels.

INPUTS

Table 6 shows the level of investment in research and education to Knowledge Areas 801 and 607, Individual and Family Resource Management (Family Economics) and Consumer Economics, made by all sources for which data is available. Table 7 shows the relative investment of various CSREES sources. The figures do not reflect CSREES' investment in extension distributed to Land-grant University partners via formula and appropriated at the discretion of the State Extension Director/Administrator. The agency does not have a means for aligning this funding with Knowledge Areas at this time.

CSREES invested \$12.5 million in research and education to KA 801 and 607 during the five-year period FY 2000 through FY 2004, slightly more than 26 percent of the total amount invested during this time by all funding sources. The contribution by CSREES decreased from 40 percent in 2000 to 17 percent in 2004. The largest proportion of CSREES funding, via Hatch funding for research, also has shown a steady decline over the five-year period. These declines are attributable to shifting priorities for CSREES funding, reductions in Land-grant faculty in these focus areas, and variability in competitive proposal quality. Further, the decline is attributable to changing macro forces that redirect attention away from societal needs at the household level toward newly-identified and emerging issues in agricultural science. Research and integrated programs receive limited support from the National Research Initiative program on Rural Development. Likewise, there are no specific programs targeted through CSREES Science and Education Resources Development though significant funding has been achieved to support multi-university alliances to deliver higher education programs.

Table 6: Funding for KA 607/801, Combined, All Sources

Sources of funding	Fiscal Year (<i>in thousands</i>)					
	2000	2001	2002	2003	2004	Total
CSREES	4,388	2,478	1,892	2,310	1,432	\$12,500
Other USDA	556	561	385	97	217	\$1,816
Other Federal	302	448	905	280	486	\$2,421
State Appropriations	4,451	4,280	6,081	4,660	5,399	\$24,871
Self Generated	166	139	162	96	258	\$821
Independent/GR Agreement	454	492	529	213	480	\$2,168
Other Non-Federal	542	707	730	985	350	\$3,314
<i>Total</i>	10,859	9,105	10,683	8,643	8,622	\$47,912
CSREES as % of Total	40.41%	27.22%	17.71%	26.73%	16.61%	26.09%

Table 7: Funding for KA607/801, Combined, CSREES Sources

Funding Source	Fiscal Year (<i>in thousands</i>)					
	2000	2001	2002	2003	2004	Grand Total
Hatch	1,376	1,405	1,211	1,111	976	6,079
McIntire-Stennis	15	10	10	0	0	35
Evans Allen	169	183	201	129	151	833
Animal Health	0	0	0	0	0	0
Special Grants	0	31	37	46	104	218
NRI Grants	21	278	161	675	24	1,159
SBIR Grants	0	0	40	0	168	208
Other CSREES	2,807	571	231	350	10	3,969
Total CSREES	4,388	2,478	1,892	2,310	1,432	12,500

Not reflected in these tables is additional funding conservatively estimated at \$1.8 million over the review period from national-level partnerships. Via national leadership by CSREES, these funds flowed directly to Land-grant partners via contracts, grants, and in-kind resources (e.g., publications, consultation, training, web site development). Among these strategic partnerships are:

- **Financial Literacy and Education Commission (FLEC)** <http://www.mymoney.gov> represented by 20 federal agencies working together to increase the effectiveness of the federal government in improving the financial literacy of U.S. citizens.
- **American Savings Education Council (ASEC)** <http://www.asec.org> represented by nearly 200 organizations from the business, non-profit, and government sectors concerned with building public-private partnerships to deliver personal finance education. A subset of ASEC is the **Government Interagency Group (GIG)**, composed of federal government representatives.
- **Jump\$tart Coalition for Personal Financial Literacy** <http://www.jumpstart.org> represented by nearly 120 partners from the business, non-profit, and government sectors focusing on youth personal finance education, kindergarten through college.

- **National Savings Forum** represented by key national partners steering *America Saves*, a social marketing approach to encourage savings and debt reduction among lower and middle income Americans. CSREES is a partner with the Consumer Federation of America to deliver this program. See <http://www.americasaves.org>.
- **National Endowment for Financial Education (NEFE)** is an operating foundation focused on partnering for financial well-being. CSREES has a Memorandum of Understanding with NEFE to revise, deliver, and evaluate the NEFE® High School Financial Planning Program. See <http://www.nefe.org>.
- **InCharge Education Foundation** <http://www.inchargefoundation.org> provides web-based technical support for two national 4-H curriculums – Consumer Savvy and Financial Champions.

FINANCIAL INDEPENDENCE, STABILITY, AND SECURITY

CSREES works through its Land-grant and other partners in research, education, and extension to help individuals and families manage resources of time, money, and human capital. Much of the recent work has turned to issues of family financial security, which is the ability to meet day-to-day expenses while planning, saving, and investing to achieve longer-term goals. Through individual and family resource management and consumer education, individuals and families learn how to:

- Assess individual or family financial circumstances;
- Establish short- and long-term financial objectives to support identified goals;
- Develop a plan of action to meet goals;
- Activate the plan of action;
- Periodically review and adjust the plan, as needed;
- Measure progress toward the achievement of goals over time.

This work addresses optimizing income potential, purchasing wisely, managing debt, managing risk, saving, and investing to build financial assets that can be used to buy a house, fund higher education, start a business, or secure a comfortable retirement. Other emphasis areas focus upon protecting assets from fraud and transferring assets at death. The activities of Knowledge Areas 801 and 607 are complemented by research in the CSREES National Research Initiative (NRI) Markets and Trade, and Rural Development programs committed to research on family and firm decision-making, U.S. monetary policy, consumer behavior, risk management for agricultural producers and rural business, and poverty and welfare.

OUTPUTS

Research, education, and extension work increases knowledge about how individuals and families obtain and use resources of time, money, and human capital to improve their quality of life. Research findings are applied to help individuals and families build wealth and achieve their goals. Research findings also inform public policies and

programs, identify the relationships between families and macro-economies (e.g. family-owned business, employer, community, nation), and consider how consumer response affects market economies.

Research

Research outputs include research agendas, published papers, and other evidence of knowledge generation. A research agenda addressing financial independence, stability, and security was developed by a North Central Regional Research Coordinating Committee (NCR-52), with faculty from 18 Land-grant universities across the Nation. They shared the research methodology and launched multi-state research projects focused on the small business viability, household effects of welfare reform, and psychological and cultural determinants of savings.

Education

To address the need to prepare more professionals for financial services careers, a consortium of seven universities came together with funding from the Departments of Agriculture and Education to develop a distance education Family Financial Planning Masters degree.

Extension

Extension activities focused on targeted audiences. Helping youth understand achieving financial independence, CSREES worked with the National Endowment for Financial Education® (NEFE) to revise, deliver, and evaluate the NEFE High School Financial Planning Program®. The 4-H Cooperative Curriculum System launched the complementary programs Financial Champions, Consumer Savvy, and Be-the-E (entrepreneur). To assist financially vulnerable individuals and families, key programs were developed to address tax credits and basic savings. To help individuals and families prepare for the financial demands of aging, an extension initiative on “Financial Security in Later Life” was developed.

OUTCOMES

Short-Term

Short-term outcomes of research have been to identify policy- and education-relevant research questions, identify emerging needs for human capital, explore distance education and multi-university alliances, and build capacity for community educators. Extension short-term outcomes are for learners to gain awareness, knowledge and skills related to money management and informed consumer choice and for small business managers to know the importance of understanding consumer demand.

Research

Family Business Viability in Economically Vulnerable Communities (NE-167), a northeast multi-state research project, funded in part by Agricultural Experiment Station formula funding, includes faculty from 13 universities who have studied 794 family

businesses in great detail. They found that more than 18 million U.S. households (almost 14 percent of the total) own at least one business and together represent about half of both the nation's gross domestic product and total wages. They examined the economic impact of family businesses and quantified the economic and social contributions of family businesses to their local, state, and national economies. The group received the Northeastern Regional Agricultural Experimentation Directors Research Award for Excellence in January 2001. Their collective work has produced 111 refereed publications. <http://www.human.cornell.edu/ne167/>

An NRI project, *From Welfare to Work: The Effectiveness of Policy in Rural Labor Markets*, Oregon State University, studied the effectiveness of public welfare policy in helping families achieve economic self-sufficiency in rural labor markets. This research team analyzed the transitions toward economic self-sufficiency made by rural workers in Oregon who receive social supports such as welfare, job training, child care subsidies, or health insurance. They studied the relative contributions of personal characteristics, local labor market conditions, and social supports to successful transition of welfare to work – and learned that the lack of jobs in rural areas paying a living wage limits the effectiveness of public policy in helping families achieve economic self-sufficiency. Among low-income workers in Oregon (and probably elsewhere), net spendable income actually declines as earning increase for these workers, because decreases in social supports outpace income gains. Rural low-income workers work less, make less, and experience more time at poverty-level earning than their urban counterparts. Local job growth increases the probability that a jobless poor adult will get a job and shortens the length of time until s/he finds a job. The research team helped Congressional staff and policymakers better understand some of the barriers to work facing low-income adults in rural areas and the differential impacts of welfare reform in rural and urban areas. Research results are being used at the state level to develop a policy analysis tool linking alternative policies and poverty outcomes. The Oregon Poverty Dynamic Simulation model also uses these research results.

Medium-Term

At the medium-term level of outcomes, research has significantly informed such topics as family business viability, the importance of early communications in farm succession planning and transfer, and the critical components of assuring financial security later in life. Degree and certification programs have been launched based on multi-institutional alliances and distance education. Extension learners have adopted practices such as developing a plan and adopting practices to achieve financial security.

Education

Financial planners are increasingly in demand as Americans seek advisors to help manage their income, assets, and debts. To meet this demand, 10 land-grant universities aligned to create the Great Plains Interactive Distance Education Alliance (GP-IDEA). With start-up funding from the U.S. Departments of Education and Agriculture, this alliance launched its first masters degree and certificate program in family financial planning in Fall 2000. In Spring 2004, 16 people received a degree and three were

certified as financial planners. Currently, more than 100 students are enrolled and the program is cost effective. <http://www.gpidea.org/prospective/financial/fpProgram.html>

Extension

The Montana Estate Planning Program (2004) reached 750 farm and ranch families on the topic of effectively transferring their farms and ranches to future generations. This series of education programs was presented by the Montana State University Extension Service in cooperation with the Montana Grain Growers Association, the Mountain States Beet Growers, and the Western Center for Risk Management Education. As a result of the program, Montanans were taking action to develop, review, and complete their estate plans. Results show 81 percent discussed estate planning with family members; 48 percent reviewed their property titles and 19 percent made changes; 26 percent reviewed their need for life insurance; 21 percent reviewed their will and had an attorney update it; 19 percent made a list of tangible personal property; 17 percent began a gifting program; and 16 percent had an attorney write a will.

Long-Term

Long-term outcomes for research include informing public policy to encourage and increase household asset development. The investment in human capital is increasing, as demonstrated by more demand for and attainment of degree and certificate programs. As individual wealth increases, the national savings rate increases, as does the accumulation of financial capital to fund business start-ups, thus improving the quality of life in rural areas.

Extension

Potential long-term outcomes for emerging adults accrue through the NEFE High School Financial Planning Program®. This six-unit program, initiated in 1984 as a public service to increase the financial literacy of America's youth, provides teens with a greater understanding of and ability to manage their personal finances. The program uses games, simulations, case studies, and interactive exercises to provide hands-on experience for students to test and apply the financial principles and concepts being taught. During the review period, 2000-2004, the NEFE HSFP was taught to more than 500,000 students annually in all 50 states and the District of Columbia. A nationwide evaluation first conducted in the late 1990s and repeated in 2001 showed students gained knowledge and skills with money. A three-month follow-up showed students maintained changed behaviors, especially savings, and exhibited self-confidence about money, a lifelong skill.

SUCCESS STORIES

America Saves (2002-2004)

America Saves, offered in partnership with the Consumer Federation of America (CFA), is a nationwide social marketing campaign to encourage all Americans, especially those of low to moderate means, to save and build wealth and reduce debt. Similar to health and safety campaigns to encourage buckling up and not drinking and driving, America

Saves combines broad public awareness, small group education, and individual assistance to persuade people to select a savings goal and establish and commit to a simple plan. America Saves is offered locally by broad-based coalitions of government, business, and non-profit groups. Since its launch in 2002, major foundations such as Ford, Bank of America, Provident Financial, and the National Endowment for Financial Education® have supported this work.

As of December 2004, Cooperative Extension in 20 States has either led or participated in a coalition to offer 31 local Saves campaigns. The most effective programs build awareness through mass media, provide motivational workshops, offer access to Saver coaches, and follow up with Savers to encourage success. An additional three local coalitions, plus a Youth Saves campaign with 4-H as a partner, are gearing up for launch. Key findings show:

- 17,809 Savers enrolled.
- An estimated \$7,576,338 saved, which averages \$564 per person.
- The top three savings goals were for emergencies, debt repayment, and home ownership. Other goals were for a vehicles, retirement savings, or starting a business.

As with any effective partnership, each organization brings resources and expertise resulting in a greater impact than either could achieve alone. CFA provides such assistance as Saver sign-up brochures tailored to the local need, technical assistance including staff training and site visits, and challenge grants for start-up costs. Direct contributions to local Cooperative Extension offices include:

- Brochures, posters, and membership cards printed for local campaigns at a cost of \$39,900.
- Generic brochures (“brought to you by Cooperative Extension”) at a cost of \$16,370.
- Shipping costs of \$5,536.
- Seed grants to Cooperative Extension educators totaling \$80,044.
- Travel for Extension educators to attend coordinator meetings totaling \$20,912.

Financial Education through Taxpayer Assistance (2004)

Many low income working families are eligible for a variety of income tax credits such as the Earned Income Tax Credit (EITC). This extension initiative helps people prepare and electronically file income tax returns and then get financial education to help maximize tax refunds. The target audience is low- to moderate-income, disabled, homebound, and “English-as-a-second-language” taxpayers, particularly in rural areas where choice – access to and availability of – tax preparation and e-filing services is limited.

Nationwide, as many as 20 percent of eligible families do not take advantage of the federal Earned Income Tax Credit (EITC), averaging more than \$2,000 per family. A

California study found that in rural areas only 17 percent of eligible Latinos, 57 percent of eligible Whites, and 59 percent of eligible Blacks actually received the EITC. Many EITC-eligible families are also eligible for a \$1,000 per child tax credit and the child and dependent care credit. Taxpayers who receive these credits pay an average of \$175 in tax preparation fees that are difficult to afford. Many take out costly refund anticipation loans to pay for tax preparation.

Twelve states have been identified as current or interested providers of activities related to financial education through taxpayer assistance serving rural areas. Five of the 12 states either directly provide or indirectly support free tax preparation and filing services in partnership with the IRS Volunteer Income Tax Assistance (VITA) program. In Missouri, financial education through taxpayer assistance is currently offered through the Missouri Taxpayer Education Initiative (MoTax) and a specialist team within University of Missouri Extension provides year-round leadership, marketing, VITA site coordination, and educational support for this initiative. For the 2004 tax season (2003 tax return) in Missouri the key results from the MoTax initiative are:

- Across the 26 VITA sites serving 19 rural counties, 1,912 federal income tax returns were prepared and electronically filed by IRS-certified VITA volunteers.
- Of the total returns, 91 percent (1,736) had federal refunds totaling \$1,953,916.
- 742 returns had the Earned Income Tax Credit (EITC) totaling \$1,000,940.
- According to filing status, clients at VITA sites were as follows: 65 percent (1,237) single, 17 percent (318) married filing jointly, <1 percent (18) married filing separately, and 18 percent (339) head of household.
- Total number of dependents on all federal tax returns was 782.
- 2,230 filers received financial information and educational materials to promote financial stability and wealth building.
- Low income taxpayers saved an estimated \$334,600 in tax preparation and filing fees.

Financial Security in Later Life – A Cooperative Extension Initiative (2000-2004)

Preparing for retirement and potential long-term care costs takes planning, saving, and debt control. This extension initiative seeks to help people improve personal finance behaviors leading to financial security in later life, enhance the capacity of local educators and their partners to deliver effective programs, and increase economic vitality and quality of life for families and communities. This educational initiative offers a toolkit of web-based and face-to-face programs designed to encourage participants to:

PLAN for retirement and potential long-term care costs (including *Planning for a Secure Retirement, Financing Long Term Care: A Resource Center for Families*)

ACT to save and invest (*Guidebook to Help Late Savers Prepare for Retirement*, developed in cooperation with the National Endowment for Financial Education®; and *Investing for Your Future* developed with the U.S. Securities and Exchange Commission), and

EVALUATE to assure actions are on track to achieve financial goals.

What difference has this program made for participants?

As of January 2005, 24 states reported 36,563 individuals enrolled in one of more of eight educational program curricula. Among key findings are:

- 90 percent of program participants increased their financial literacy related to later life issues
- 62 percent planned to use recommended financial management practices
- 48 percent planned to manage their use of credit, reduce debt, and/or reduce household spending in light of their long-term goals for later life
- Of those who also were surveyed using additional follow-up survey techniques (22,752 individuals), 45 percent reported using one or more recommended financial management practices from an initiative program; 53 percent reported they developed plans to achieve retirement and/or future income goals; 47 percent reported that they had increased their financial security and 80% reported that the program was valuable to them

The FSLI initiative has also had a direct economic impact on those who have completed initiative programs. A group of 7,574 individuals who completed Initiative-related programs reported a total of \$6,307,708 of annual financial impact (such as dollars saved, debt reduced, new dollars invested). This is an average of over \$833 per person per year.

More than 45 state Extension services have been involved in capacity-building training for educators and community partners (e.g. Initiative rollout conference in March 2002, satellite videoconference in December 2003). Survey results showed 81% of educators planned or conducted FSLI programs and 90 percent rated eight specific curricula in the FSLI Initiative toolkit as having either good or excellent value to them in conducting educational programs.

NEW DIRECTIONS

In order for Knowledge Areas 801 and 607 to be relevant in a rapidly changing society, some shifts must occur. An overall concern is that the scholarship in this area is diffuse and often addresses only some relevant issues. Geistfeld (2005, 412-413) noted, "This research must, however, be published in recognized journals and form a recognizable CEFE (Consumer Economics and Family Economics) body of knowledge. This body of knowledge must not only inform outreach efforts but also inform undergraduate and graduate education." The following recommendations frame an appropriate future.

Research

Apply change theory to financial behavior. Little is known about what motivates the decision to save, and what changes lead a person to become a lifelong saver. A new multi-state research project, NC-1013, shows promise in identifying the economic, psychological, and cultural determinants of household savings behavior. Significant

research has described savings behavior by U.S. individuals and families, including important contributions by the Economic Research Service, USDA, using farm households as the unit of measure. Using the Transtheoretical Change Model by James O. Prochaska, the research will help educators and policy makers understand why some people, regardless of income, current asset accumulation, education, and other factors, are avid savers and others are challenged to set aside any money for tomorrow. The change theory suggests people move through stages to change behavior. These stages are precontemplation, contemplation, preparation, action and maintenance.

Increase the number of projects identifying consumer demand of products and processes important to agriculture. CSREES has funded a limited number of projects looking at consumer acceptance of irradiated foods, genetically modified crops, post-harvest treatment of oysters, and chemically extending the shelf life of fresh produce. The NRI could include a segment on consumer demand, specifically addressing the public receptivity of new food and fiber products. Understanding consumer decision-making relative to purchases can help predict the profitability of agriculture and sustainability of rural economies.

Link household asset and community development. To what extent do household assets fuel entrepreneurship in rural communities? What affect do financially secure families have on community prosperity? How do financially strong families engage in community leadership? These are important questions requiring multi-disciplinary modeling at CSREES.

Education

Following the model of GP-IDEA, create alliances for delivering degree programs amongst 1890 and 1994 colleges and universities. For example, three CSREES 1890 Capacity-building projects were funded in 2004 to build an alliance of eight 1890 institutions, train faculty on personal finance, and deliver a certification program on family financial planning. The certificate program is expected for launch in fall 2006. The program prepares students to take the Certified Financial Planner® exam. This meets a need for financial planners in African American communities. A similar need has been expressed for Native American communities.

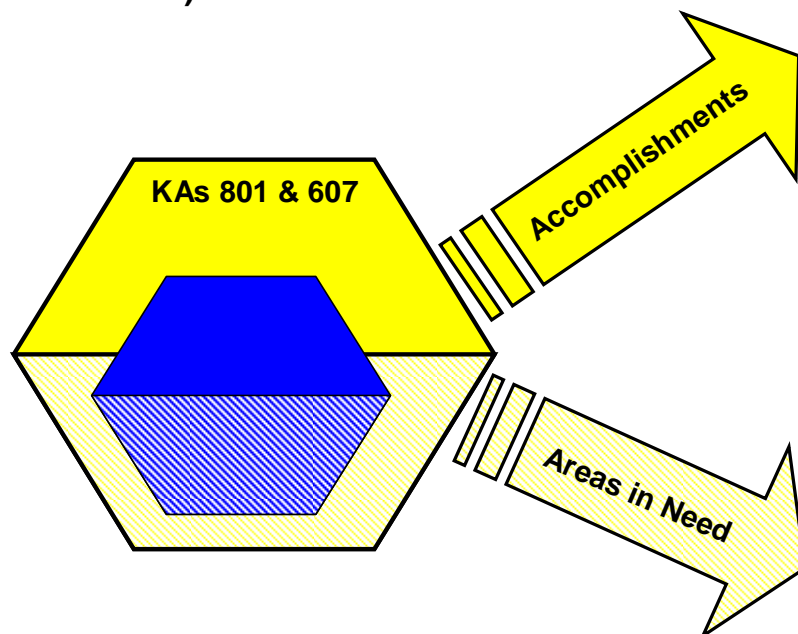
Extension

Expand outreach to low-wealth families. The new Bankruptcy Reform Act requires that every person filing for bankruptcy must go through an educational program before their case is discharged. Extension Services in many states are appropriately positioned to offer this education for a fee. New Jersey processes about 40,000 personal bankruptcy cases annually. By charging the acceptable fee of \$100 for the educational program, the potential revenue stream could be \$4 million. State-level successes with such programs as the Rural Taxpayer Education Initiative also must be expanded.

Maximize the capability of eXtension. Electronic extension, designed to be a complement to place-based education, will be ready for public launch mid-year 2006. “Financial Security for All” has been selected as a pioneer Community of Practice. Can eXtension be the e-commerce platform for delivering Internet-based bankruptcy education, or meeting the OPM requirement for all federal employees to have access to personal finance education? There are exciting opportunities in this area.

Figure 6 – KA 801 and 607 Honeycomb

Knowledge Areas 801 & 607: Individual and Family Resource Management (Family Economics) and Consumer Economics



KAs 801 & 607 - Major Themes



Financial Independence, Stability, and Security



- Individuals and families have increased their knowledge, skills, and motivation to plan and take action to secure their financial futures by building wealth, not debt.

- More household savings is available to fund post-secondary education of family members and provide start-up capital for rural small and home-based businesses.

- Multiple universities have shared resources and expertise to offer an Internet-based masters degree program in family financial planning, setting the stage to expand the pool of highly qualified financial service providers.

- Research has expanded knowledge about the significance of family-owned business to rural economics and households, and the effects of public policy on family economic well-being.



- Conduct research to better understand the psychological and cultural incentives and barriers to personal savings.

- Increase the number of projects designed to understand consumer demand of goods and services and its effect on business profitability.

- Advance multi-disciplinary approaches to link household assets and community economic development.

- Expand the university alliance model to deliver family financial planning degree programs through 1890 and 1994 colleges and universities.

- Create more opportunities to reach low-wealth individuals and families with basic personal finance education.

- Maximize the capability of eXtension to reach communities of interest targeting youth, financially vulnerable families, and people throughout the life cycle making decisions affecting their financial security in later life.

Knowledge Areas 721 and 722: Insects and Other Pests and Zoonotic Diseases and Parasites Affecting Humans

OVERVIEW

Portfolio 2.2 includes research, education, and extension activities to provide informed decisions affecting the quality of life in rural areas. This portfolio area reflects the needs of our partners and stakeholders. To adequately address the needs and develop effective solutions, several areas of both biological and social science are needed. The challenges are great, given the enormous changes impacting the United States population in the past 100 years. Furthermore, there are a large number of invasive arthropod pests, animal diseases, and parasites affect humans. These pests may cause severe bites, skin irritations, allergic reactions, and childhood asthma. Other pests serve as vectors for parasites which harbor diseases that threaten human life or lead to chronic health problems. Two Knowledge Areas (KAs) that address these problems are KA 721 and KA 722.

Insects and Other Pests Affecting Humans (KA 721): This knowledge area includes insects, ticks and mites that are pests of humans and our structures, as well as species that are major disease vectors. The long-term goal is to develop and implement safe, effective, and economical ways to manage these pests. This knowledge area includes work on the biology of insects, ticks, and mites affecting humans, including those important in forensic studies. Some pertinent focus areas encompass the development of attractants and repellents and the development and improvement of methods of pest control.

Zoonotic Diseases and Parasites Affecting Humans (KA 722): This knowledge area concerns parasites and animal diseases such as West Nile Virus, Malaria, Encephalitis, Lyme disease, and Human granulocytic ehrlichiosis that pose potential threats to human health. Research includes studies on epidemiology, risk assessment, and evaluation of efficacy of control programs for disease vectors. Areas of research include: understanding mechanisms involved in transmission of disease to humans, developing control programs to reduce animal reservoirs of zoonotic agents, and developing means of preventing transmission of zoonotic diseases and parasites from animals to humans.

Knowledge Areas 721 and 722 are closely linked. There are several reasons for this connection. For one, many arthropod pests are both an annoyance to humans or animals *and* important disease vectors. For example, honeybees, ants, or wasps may inflict harmful bites or stings, and mosquitoes, ticks and mites can transmit disease-causing pathogens to humans. In addition, pests can make humans more susceptible to disease (e.g., allergic reactions to cockroaches or dust mites are associated with increased risk of childhood asthma or rhinitis in elderly people). Furthermore, much can be learned from control programs adopted for nuisance pests and those that transmit diseases (e.g., development of repellants or attractants for flies could be useful as attractants for disease-causing mosquitoes). Therefore, both Knowledge Areas are represented

together in this section because they have similar situations, assumptions and external factors for research, education, and extension programs supported by CSREES.

Several emerging and re-emerging *animal* diseases also affect humans (and are therefore, zoonotic). The list of zoonotic disease research actually included in KA 722 is relatively small. This is due to the close link between KAs 721 and 722 with several other KAs. Much of the zoonotic disease research is included in KA 311, and not in KA 722. **Figure 7** illustrates the relationships among KAs 721 and 722 with ten other Knowledge Areas included in portfolio 2.2 (Goal 2) and KAs that were evaluated in the Animal Protection portfolio review.

What is learned about animal diseases (e.g., a disease is transmitted by insects) will help protect humans from contracting these diseases (e.g., developing repellents or attractants). Thus, impacts reported in the other KAs have relevance to KA 721 and 722. In this section, we have selected examples of accomplishments and impacts illustrated by the logic model in **Figure 8**. We recommend that in future portfolio review analyses, that 721 and 722 be grouped with the Animal Protection Knowledge Areas (e.g., 311-314) due to their significant connection.

Figure 7 - Relationship of KA 721 and 722 to Other Knowledge Areas Included in Portfolio 2.2 and to Areas in Other Goal Portfolios, including 1.3 and 3.2.

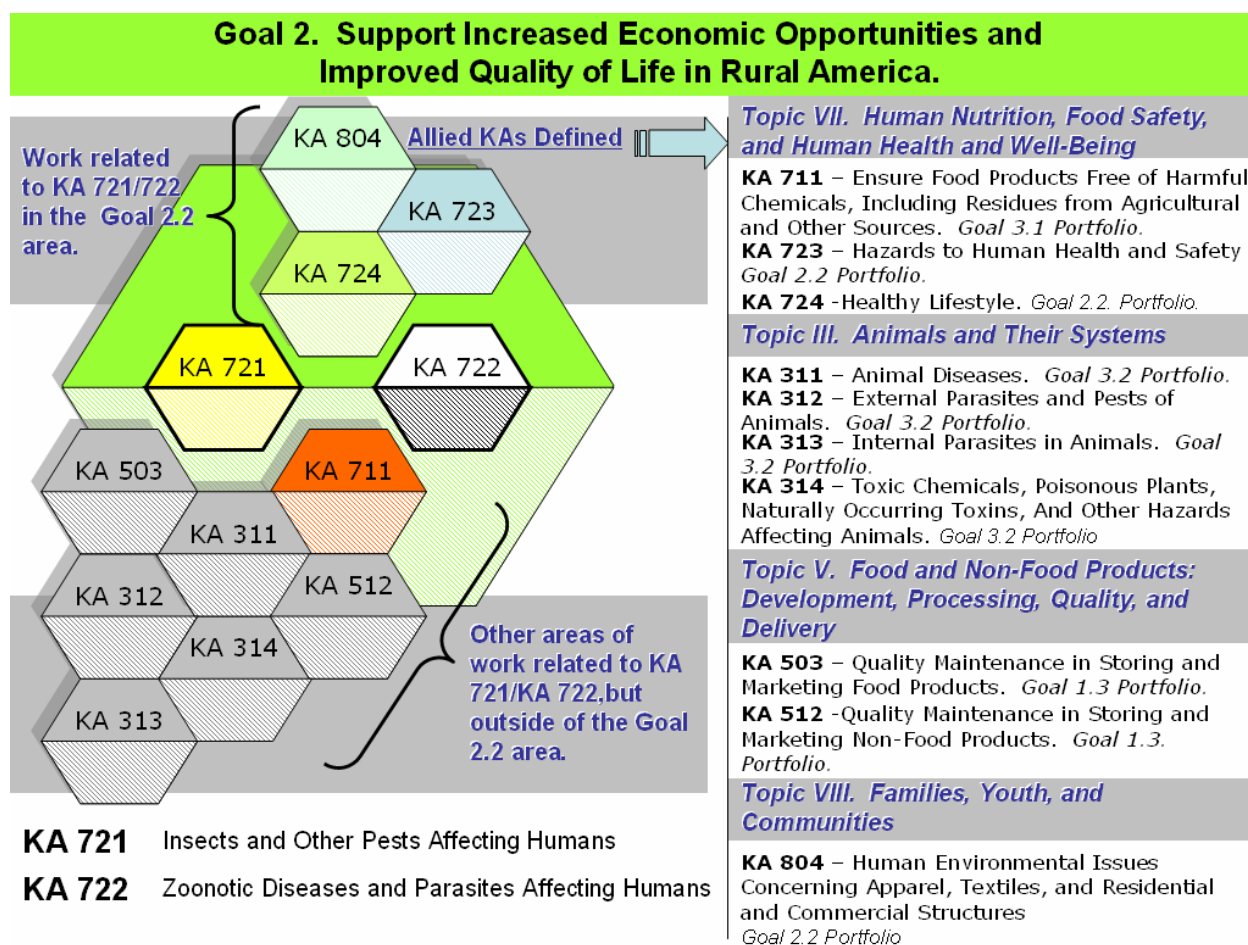
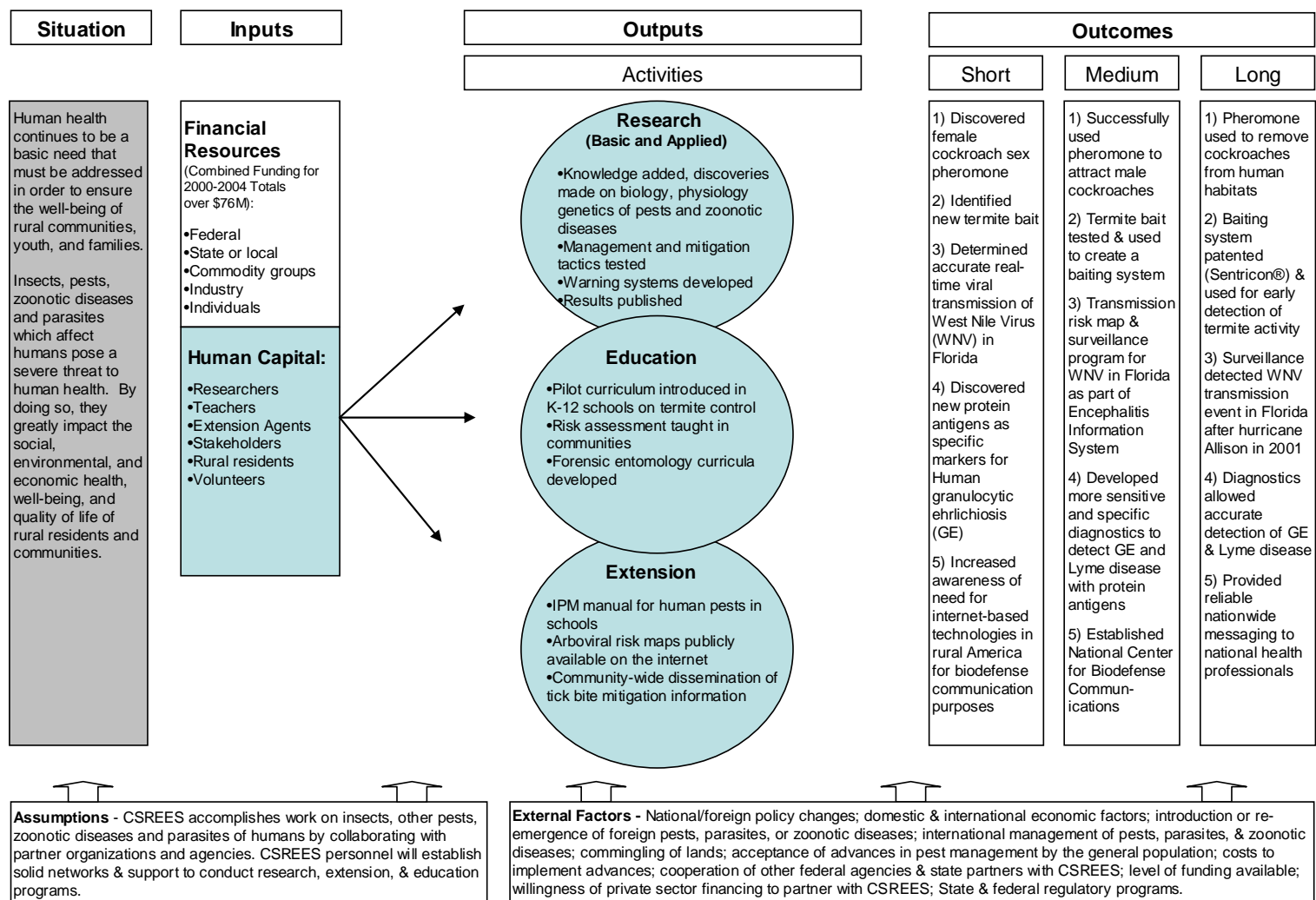


Figure 8 – KA 721 and 722 Logic Model

**Portfolio 2.2 – Informed Decisions Affecting Quality of Life in Rural Areas:
KAs 721 & 722 Pests, Zoonotic Diseases and Parasites Affecting Humans**



SITUATION

Insects and related arthropods are serious pests of humans and other animals. Ants, bees, wasps, and spiders inflict painful bites or stings which may lead to allergic reactions and anaphylactic shock, which can be fatal for sensitive individuals. An alarming increase in the incidence of childhood asthma is linked with prevalence of cockroaches and dust mites, which are often found in homes and livestock facilities. Rural areas are particularly at risk because of the prevalence of animal waste which attracts certain pests such as biting flies. In addition, the Africanized honey bees, which have caused serious injury and death to humans and animals in the southern U.S., predominantly build their nests in rural and unmanaged areas. A number of species that have been considered of minor importance, such as head lice and bed bugs, have had resurgence in recent years.

Organisms that cause life-threatening diseases in humans and other animals are commonly transmitted by insects and other arthropods (**Figure 9**). In the U.S., diseases such as Rocky Mountain spotted fever, Typhus, Encephalitis, Plague, Lyme disease, Ehrlichiosis, and West Nile virus are of chief concern to public health. In rural areas, conditions are often conducive for development and population buildup of arthropod vectors of diseases, which may use animals as hosts and streams, ponds, and other water sources to develop and reproduce.

Figure 9 - The Zoonotic Disease Cycle between Arthropods, Disease Organisms, and Vertebrates

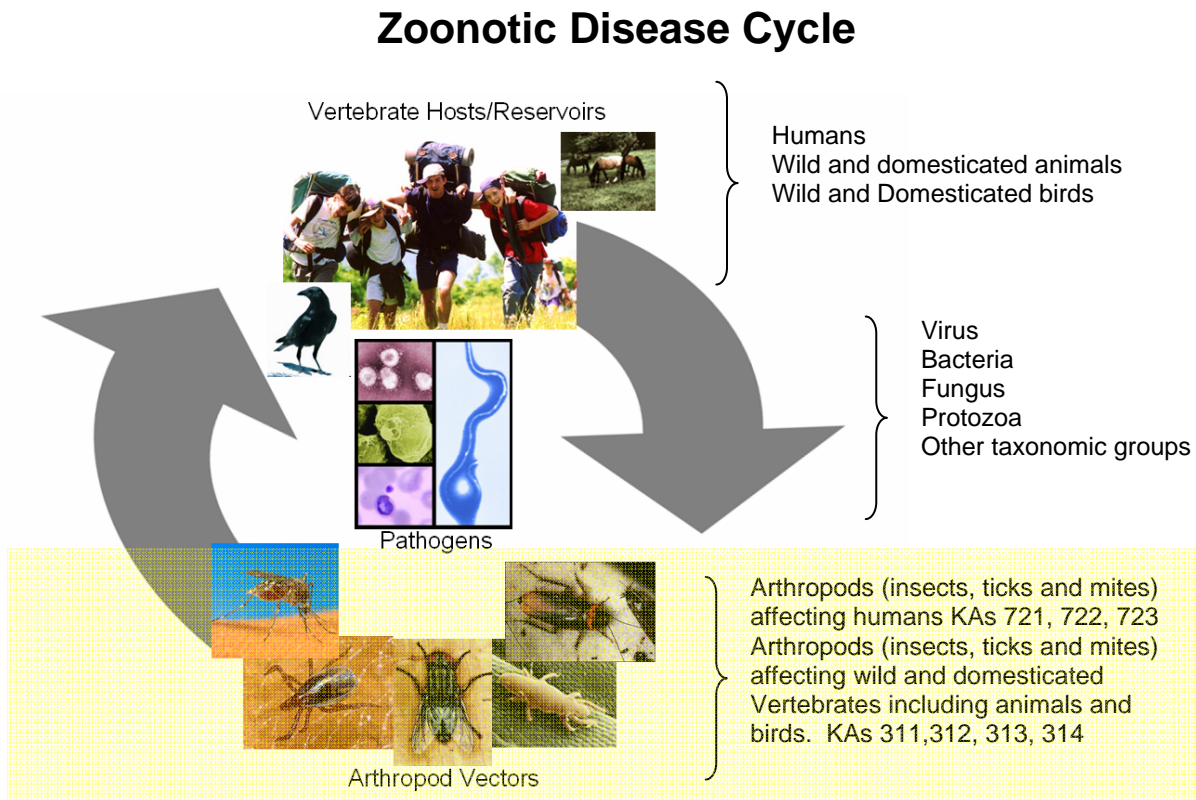


Photo credits: mosquito, Ralph Williams, Purdue University; Ixodes tick, Scott Bauer, USDA, ARS; house fly, University of Florida; itch mite, C. Erbe, USDA, ARS; cockroach, University of Nebraska; pathogens, NIEHS, NIH; crow, Maslowski Wildlife Productions, happy hikers at www.kahdalea.com/.../June/Hikers,-happy--web.jpg, horses, web-photo.

Human health is a basic need to ensure the well-being of rural communities. Zoonotic diseases and parasites which affect humans pose a severe threat. These diseases and parasites greatly impact the social, environmental, and economic health, well-being, and quality of life of rural residents and communities.

We need to be more prepared to face the threat of invasive pests, zoonotic diseases, and parasites both within and outside the U.S. From the perspective of homeland security, vectors that transmit organisms with the potential to cause human diseases such as Anthrax, Encephalitis, Leptospirosis, and Rabies are of particular importance. Thus, knowledge gained by our scientific community is necessary to provide the base of information needed to enable detection and containment of these potential threats. The honeycomb diagram in **Figure 10** illustrates the major pests, zoonotic diseases and parasites affecting humans and the relationship to three focus areas where greater knowledge is needed to increase our capability to mitigate these threats. Information about CSREES projects on other pests and diseases may be found in the Evidentiary Materials section. These focus areas include: 1) research on biology, genetics, and physiology of pests, disease and parasites; 2) transmission mechanisms of diseases from animals to humans (which includes the role of insects and other pests as vectors); and 3) development of methods of management which includes control and prevention strategies. Specific examples of a subset of

pests and diseases in this diagram will be expanded on later in the “Selected Examples” section of this document.

Figure 10 - Relationships of Insect Pests, Vectors, and Pathogens to Major Focus Areas in KAs 721 and 722. Solid hexagons represent pest species. Split hexagons represent vector (upper case)/pathogen (lower case) pairs. For specific vector or pest relationships refer to the narrative examples within Section III.

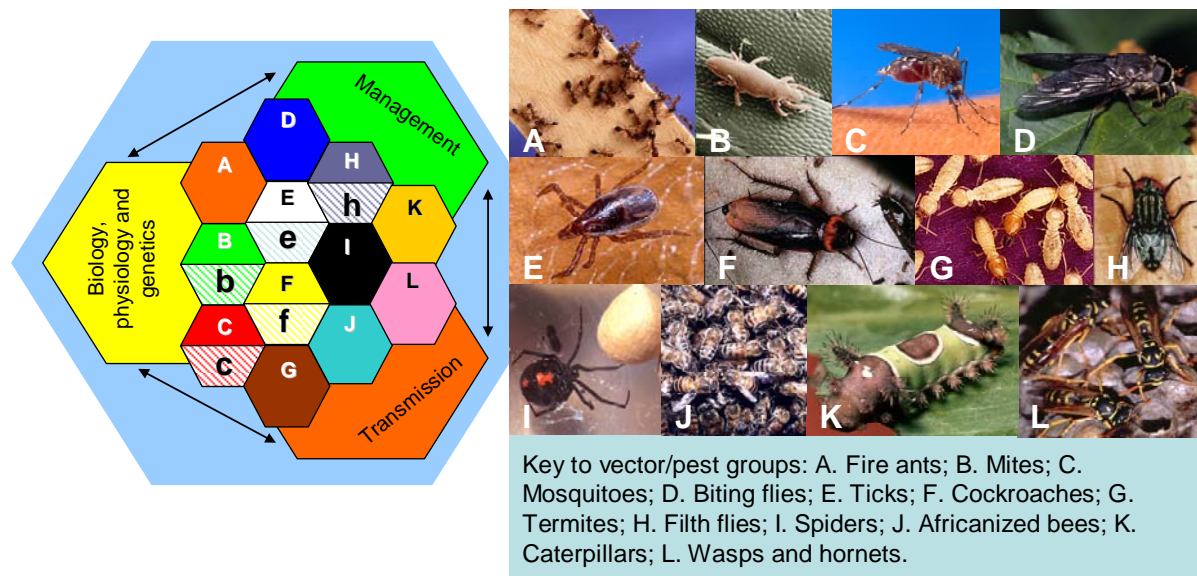


Photo Credits: Black widow spider: J. Baker, NCSU; fire ants, USDA Scott Bauer; mosquito, R. Williams, Purdue; straw itch mite, C. Erbe, USDA, ARS; horse fly, M. Cassino, USDA, ARS; ixodes tick, USDA, Scott Bauer; cockroach, University of Nebraska, termites, USDA, Scott Bauer; house fly, University of Florida; honeybees, USDA, ARS; saddleback caterpillar, Clemson University; paper wasps, M. Cassino, USDA, ARS.

Note – lowercase letters in the figure (above left) denote arthropods that can vector disease to humans

ASSUMPTIONS

- CSREES has established solid networks and support to conduct comprehensive research, extension, and education programs.
- Research, education, and extension on the management, transmission activities, and biology, physiology and genetics of insects, pests, parasites, and zoonotic diseases affecting humans provides science-based technology, products, and information for informed decisions.

EXTERNAL FACTORS

Several factors affect the performance, outcomes, and CSREES program attributes that are achieved in this knowledge area:

- National and foreign policy and political changes, including domestic and international economic factors
- Accidental or intentional introduction of foreign pests, parasites, or zoonotic diseases affecting humans and emerging and re-emerging pests, parasites, and potential associated zoonotic diseases;
- International management of pests, parasites, and zoonotic diseases affecting humans;
- Agricultural lands that are commingled with urban, suburban, and non-agricultural lands as part of complex watersheds and ecosystems, and the attendant activities taking place beyond CSREES influence;
- Acceptance/Rejection of advances in pest management by the general population;
- Costs to implement advances;
- Coordination and cooperation of other federal agencies with CSREES;
- Coordination and cooperation of partners; existence of local collaboration;
- Level of funding available for partnering efforts at the federal, state, and local level;
- Willingness of private sector financing, such as corporations, foundations, and community organizations, to partner with CSREES, adopt new advances, etc.;
- State and federal regulatory programs, including compliance.

INPUTS

CSREES provides funding and personnel or human inputs. Funding inputs for 721 and 722 research and education projects principally come from formula funds (primarily Hatch), the National Research Initiative (NRI), Special Grants, other CSREES programs (i.e., FAA, sec. 406), and Small Business Innovation Research (SBIR) programs (**Figure 11** and **Table 8**). Hatch funds were relatively stable. NRI funding increased sharply for KAs 721 & 722 in 2001 (almost a 4-fold increase) compared with FY 2000. Funding levels were not sustained in subsequent years and most likely does not reflect an actual increase in investment in projects on zoonotic diseases and parasites. The total investment by CSREES in 2004 was nearly twice as high as funding available in 2000 (1.8-fold increase in KA 721 and 1.6 fold increase in KA 722).

Funding for extension programs is more difficult to quantify. A portion of “Other CSREES” programs is allocated to integrated activities, which may include extension. Funding for “Other CSREES” programs increased 3-fold in 2004 in comparison with 2000. However, it is not clear what proportion of this increase was allocated to extension.

Figure 11 - Dollars (in 1000's) invested in KA 721 and 722 for FY2000-2004

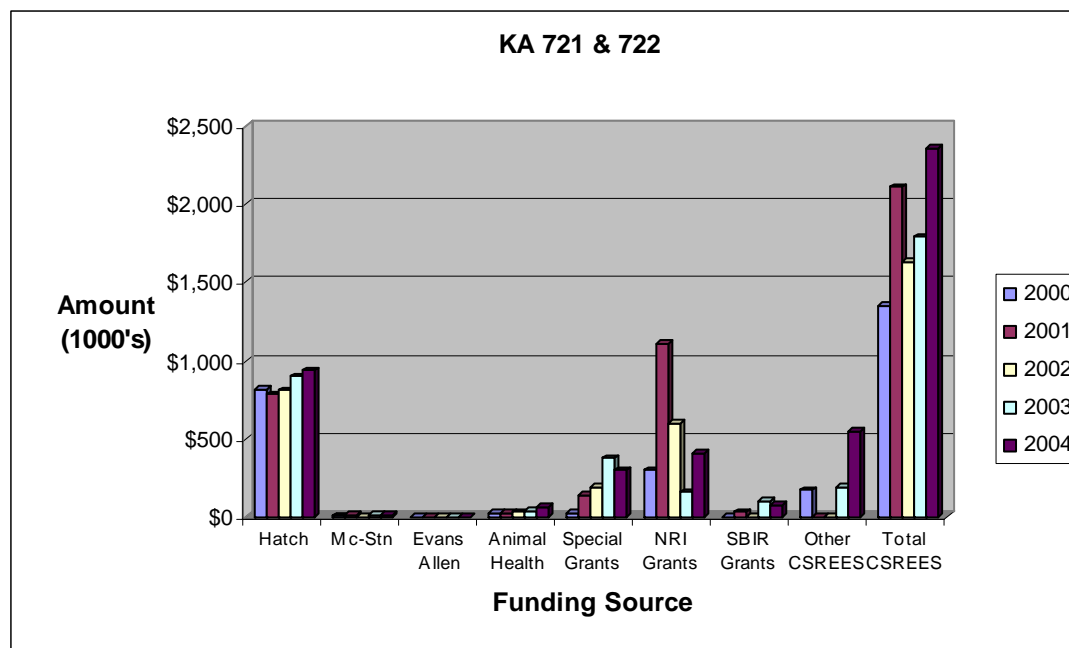


Table 8 - CSREES programs that fund KAs 721 and 722

Funding Source	Fiscal Year (\$ in thousands)					Grand Total
	2000	2001	2002	2003	2004	
Hatch	\$814	\$783	\$809	\$901	\$937	\$4,244
Mc-Stennis	\$8	\$11	\$0	\$17	\$16	\$52
Evans Allen	\$0	\$0	\$0	\$0	\$0	\$0
Animal Health	\$29	\$25	\$33	\$39	\$62	\$188
Special Grants	\$24	\$141	\$190	\$376	\$301	\$1,032
NRI Grants	\$301	\$1,113	\$603	\$158	\$412	\$2,587
SBIR Grants	\$0	\$35	\$0	\$105	\$80	\$220
Other CSREES	\$175	\$0	\$0	\$193	\$551	\$919
Total CSREES	\$1,351	\$2,108	\$1,635	\$1,789	\$2,359	\$9,241

Also, the number of scientists working on KAs 721 and 722 increased 1.6-fold between FY 2000 and FY 2004 (**Table 9**). These increases in funding and personnel inputs (although small in relation to the overall investment nationwide) will lead to greater advances, which will be realized in the next 10-15 years, in solving pest and disease problems affecting humans.

Table 9 - Scientist Year (SY) and Other Personnel Year (OY) Effort for 721 and 722

Knowledge Area	Number of Scientist Years (SYS) and Other Years (OYS)									
	2000		2001		2002		2003		2004	
	SYS	OYS	SYS	OYS	SYS	OYS	SYS	OYS	SYS	OYS
721	22.5	78.2	21.4	72.7	25.1	77	27.7	102.7	30	117.8
722	8.7	26.5	12.1	37.6	13.5	45.6	17.5	55.8	20.6	62
721 & 722	31.2	104.7	33.5	110.3	38.6	122.6	45.2	158.5	50.6	179.8

CSREES funding for KA 721 and 722 represented less than 17 percent of the total investment nationwide in 2000 through 2004 (**Table 10**). Other federal funds and state appropriations accounted for the highest proportion of funds invested in these Knowledge Areas. The National Institute of Health (NIH) historically received much larger allocations of funds to address pests, diseases, and parasites of humans, because their primary mission is to advance human health. USDA has a much broader charge, which includes advancement of knowledge for agriculture and the environment in addition to human health and communities. CSREES maximizes resources by leveraging inputs with other state and federal agencies.

Table 10 - Research and Education Funding for KA 721 and 722

Sources of funding	Fiscal Year (<i>in thousands</i>)					
	2000	2001	2002	2003	2004	Total
CSREES	\$1,351	\$2,108	\$1,635	\$1,788	\$2,360	\$9,242
Other USDA	\$813	\$588	\$467	\$373	\$550	\$2,791
Other Federal	\$1,612	\$2,901	\$3,310	\$5,287	\$6,808	\$19,918
State Appropriations	\$5,063	\$5,630	\$6,768	\$7,689	\$7,291	\$32,441
Self generated	\$56	\$61	\$541	\$641	\$518	\$1,817
Industry/Grants and Agreements	\$800	\$795	\$1,125	\$1,414	\$1,867	\$6,001
Other Non-Federal	\$627	\$482	\$479	\$846	\$1,460	\$3,894
<i>Total KA 721 & 722</i>	\$10,322	\$12,565	\$14,325	\$18,038	\$20,854	\$76,104
CSREES as % of Total	13.09%	16.78%	11.41%	9.91%	11.32%	12.14%

OUTPUTS

CSREES' investments, while small compared to the number of critical and chronic issues needing attention, have produced significant outputs for important needs of stakeholders and partners. The agency's portfolio covers many diverse activities which include discovery of new foundational knowledge related to biology, physiology, genetics of insect pests and zoonotic diseases affecting humans, host-pathogen interactions, immunology, non-infectious disease and conditions, epidemiology, and ecology.

Research

- Better understand the role pests and diseases play in affecting human health and quality of life (e.g., childhood asthma, allergic reactions, and diseases);
- Elucidate the genetic and physiological mechanisms of action in pests and diseases which are relevant to target sites that can be manipulated for pest control purposes (e.g., identify the glands that are sites for pheromone production in insect pests and understand how these glands are regulated);
- Develop and/or improve rapid accurate and cost effective monitoring technologies, including new and improved diagnostics for early detection and management;
- Develop and/or improve new vaccines and treatments for humans.

Extension

- Develop and improve the methods of pest and disease control including the discovery of innovative treatments or preventives, through dissemination of information by workshops, meetings, and other communication media;
- Develop emergency preparedness for the accidental or intentional introduction of pests, parasites, or zoonotic diseases affecting humans by increasing biodefense communications among Federal and local policymakers, healthcare professionals, and first-responder recipients in rural America;
- Coordinate with existing national networks to rapidly detect invasive pests and diseases (e.g., National Animal Health Laboratory Network) and interact with regulatory agencies (e.g., APHIS) to assess and limit spread of pests.

Education

- Improve knowledge and awareness of integrated and biologically-based pest management methods that are more compatible with the environment, and pose fewer risks to public health;
- Recruit, retain, graduate, and place the next generation of research scientists, educators, and practitioners in pest control for public health.

CSREES' National Program Leaders actively participate in meetings held by professional or scientific societies and associations, to help inform these stakeholders regarding program development in research, extension, and education. Some examples include: The American Society of Microbiologists, Entomological Society of America, Society for Vector Ecology, American Mosquito Association, Conference for Research Workers in Animal Diseases; United States Animal Health Association Conference; Extension Disaster Education Network (EDEN), Plant and Animal Diagnostic Network (PADN), the American Public Health Association, and the Annual Rural Health Conference. In addition, National Program Leaders are members of various Federal interagency working groups, multi-state committees and task forces. Some examples include the Invasive and Terrestrial Animals and Pathogens Working Group, the Prion Science Working Group, and the Infectious Disease and Informatics Working Group.

In addition, NPLs work closely with land grant universities to help develop strategic plans such as the Road Map for Integrated Pest Management, Science Road Map for Agriculture (2001), National Association of State Universities and Land-Grant Colleges (NASULG), and Experiment Station Committee on Organization and Policy (ESCOP).

OUTCOMES

CSREES' return on investment, while not formally calculated, is thought to be extremely high. Illustrative examples follow, with many more included in the evidentiary materials.

Short-term

CSREES research programs help fill key knowledge gaps related to pest and disease biology, which is leading to more effective and environmentally sound management of pests, diseases, and parasites of humans. Educational programs support the training of the next generation's workforce that will meet the needs of rural America in future years. For example, CSREES has facilitated the development of new curricula and materials, including instruction delivery systems that address diverse student learning abilities. The agency also directly supports the training of undergraduates, graduate students, and postdoctoral opportunities through fellowships and scholarships. Experiential learning opportunities will equip students with essential skills needed for future careers in public health, parasitology, pathology, pest management, or forensic science. Even if students do not pursue careers in these fields, these learning experiences will heighten appreciation of the importance of these areas to the quality of life in rural America. Extension programs are responsible for effective public dissemination of significant discoveries and new technologies that will mitigate the effects of these pests, zoonotic diseases, and parasites. Extension agents communicate this information through written materials (i.e., publication of fact sheets or bulletins and electronic websites) and by holding training courses and workshops to better raise people's awareness of kinds of the problems or risks imposed by these pests and diseases.

Medium-term

Research, extension, and education lead to the development of new vaccines, diagnostic tests, patents and licenses for new products, which enables the implementation of new practices for managing pests and zoonotic diseases. New policies in rural areas are adopted as a result of changes in learning or heightened awareness about the severity of these pests, diseases and parasites to quality of life.

Long-term

The new practices put into place contribute to reducing human exposure to pests and diseases, which improves the health and quality of life for Americans. Through wide-spread adoption of less environmentally harmful treatments or pesticides to mitigate these problems, social and

economic conditions will be enhanced. As a result, the quality of life for people in rural areas is preserved in the long-term.

DISCUSSION OF SPECIFIC EXAMPLES

1) FY2001 - Hatch, and FY 2002 Special Research Grants supported work at the University of Arkansas on *Molecular diagnostics of bacterial pathogens carried by filth flies*, (**Hatch** *Molecular genetics of economically important insects* and **Special grant** *Evaluation of monitoring systems, pathogen detection, and alternative tactics for IPM of filth flies in poultry production facilities*). Very little is known about the population genetic structure of economically and medically important insects including filth flies. Genetic techniques can provide estimates of gene flow, dispersal, and detection of locally adapted populations. This information is important for managing pests, including management of insecticide resistance by determining the extent of insecticide resistance and to monitor the spread of resistance over time. In addition, knowledge of movement of flies within and among poultry establishments and movement into urban areas will help manage spread of pathogenic organisms which are also a food safety concern, by enabling targeted control of pest flies in high risk areas.

Short-term: Using rapid molecular detection techniques, researchers discovered that three species of filth flies are also carriers of serious food-borne pathogens that affect humans, i.e., will identify *Campylobacter*, *Salmonella*, and *E. coli* O157:H7 from DNA extracted from filth flies associated with poultry.

Medium-term: Currently the research is directed to evaluate the prevalence and to characterize *Campylobacter jejuni* and *C. coli* from house flies (HF) (*Musca domestica*) collected from poultry farms. This study provides the first documented evidence that stable fly, lesser house fly, house fly and black dump fly carry *Campylobacter* in the poultry environment, and the house flies and lesser house flies carry *E. coli* O156:H7 in the same environment. Recent human deaths caused by the release of *Bacillus anthracis*, and threats of biological warfare warrant attention to rapid identification of pathogens in the human and food animal environment. These studies are now being followed by an evaluation of conventional and experimental poultry manure management systems as they influence production of filth flies, litter beetles and associated food-borne pathogens. Further research will also evaluate novel cultural, biological and chemical strategies for pest management to minimize nuisance and health risks in the rural-urban interface.

Long-term: The research results will be transferred to producers to enable implementation of more effective control programs for both flies and food-borne pathogens on poultry farms. Pathogens which cause serious food-borne diseases are a continuing concern and recent human deaths caused by the release of microbial pathogens such as anthrax (*Bacillus anthracis*) and threats of biological warfare warrant attention to rapid identification of pathogens in both the human and food animal environment. The benefit is the rapid detection of pathogen

contamination among arthropod reservoirs in 6 hours or less from DNA extraction to final pathogen identification.

2) A FY2001 (renewed in 2004) Hatch Grant supports work at the University of Arkansas (*Molecular Genetics of Economically Important Insects*) to develop molecular methods to accurately identify indigenous and invasive termite species (*Reticulitermes*), which are major pests of wooden structures. Extensive termite infestations will cause serious structural damage to homes and cost home owners thousand of dollars to eliminate. Based on the DNA sequence data, PCR-RFLP using two restriction enzymes were diagnostic for all termite species analyzed.

Short-term: First application of a molecular genetics technique for species identification of *Reticulitermes* termites. This technique allows the use of field collected specimens preserved in alcohol and can identify termites, regardless of caste.

Medium-term: This technique was used to identify unknown colonies of *Reticulitermes* to species from Arkansas, Missouri, Oklahoma and Texas.

Long-term: Increased our knowledge of the extent of geographic spread of termite species in the US. These molecular techniques will form the basis for rapid detection of invasive termite species which are a constant threat from other countries.

3) Several sources of funding were used (McIntire Stennis, Hatch, TSTAR, NRI) to support work at the University of Hawaii and North Carolina State University to evaluate least-toxic preservative treatments to prevent insect attack on Hawaiian lumber and wood products and to quantify the termite resistance of trees and forest products of potential value to forestry and the forest products industry in Hawaii. This research also aims to identify termite population markers through genetic analysis and chemical surveys in order to develop DNA fingerprinting techniques to follow the geographic spread of termites. to define the boundaries of termite colonies, and to identify social and spatial structures within colonies that might influence penetration of colonies with bait toxicants. Genetic analysis of Microsatellite DNA show that there are several breeding systems in subterranean termite colonies and this flexibility may explain why termites are so successful in invading new habitats.

Short-term: The DNA of termite species, just like other organisms possess characteristic genetic profiles, which are thought of as a genetic “barcode.”

Medium-term: Distinguish between new or old termite infestations in building structures and is now being used to diagnose which species are potentially damaging their structures and explains where the termites are coming from (either remnants of the same colony or whether there are invaders coming from outlying areas).

Long-term: Genetic profiling of termites will enable pest control professionals to better manage these pests in human habitations.

4) FY2001-2006 Hatch/Smith-Lever (b) and (c) funding supports work at the University of Florida (Foraging Behavior and Control of Subterranean Termites; Behavioral Ecology and Control of Subterranean Termites) to elucidate the tunneling geometry and foraging behavior of subterranean termites and to examine the succession ecology of colony populations of subterranean termites for an area-wide population management project. Because subterranean termites are a cryptic underground pest, little is known of their foraging behavior, and this has hindered the development of effective control measures. Effects of baiting technology for protection of historic structures and landscapes from subterranean termites has been evaluated using above- and in-ground monitoring and baiting stations. This research has resulted in the development of a technology to eliminate colonies of subterranean termites.

Short-term: A method was developed to provide pest control operators with a simple, yet effective baiting technique to manage subterranean termites.

Medium-term: University of Florida patent and licensing to Dow Agro Sciences. The baiting system is marketed as the Sentricon Termite Colony Elimination System.

Long-term: This method is widely used to manage and eliminate termites in many areas of the U.S.

5) A FY 2002 NRI Competitive Grant supported biological studies on the German cockroach, *Blattella germanica*, a key residential and food-associated pest world-wide. Cockroaches are known carriers of pathogenic organisms and certain proteins derived from cockroaches are a major source of allergies in children and rhinitis in the elderly. Schal's NRI grant enabled him to study the hydrocarbons which occur on the outer layer or cuticle of the cockroaches, the site where sex attractants or pheromones are produced. However, little was known about what types of compounds in the cockroach cuticle caused the production of sex pheromones. The long-term goal of the project was to determine what compounds were involved with pheromone production, which could ultimately be used in novel design of pest control strategies in rural areas or farms. The commercial use of pheromones with other pests has been a very successful and environmentally sound strategy for monitoring, trapping and in controlling pests directly when applied like a pesticide. These pheromones are not harmful to humans and farm animals and thus are highly sought after as alternatives to environmentally persistent and toxic pesticides which are of major concern to public health.

Short-term: Synthetic pheromone was subsequently used in laboratory tests, which showed that the synthetic compound was just as attractive as crude extracts of the pheromone from female roaches. Male cockroaches presented with the synthetic pheromone were lured to them within seconds. Subsequent trapping tests done in roach-infested pig farms showed very positive results. Discovered that a compound called lipophorin acted as a carrier of lipids to the posterior segment or pygidium of the cockroach cuticle. Schal extracted these lipids from the pygidium, which eventually led the research team to successfully isolate and identify the sex pheromone from female cockroaches, which has remained elusive to scientists for years. The chemical structure was identified which enabled them to synthesize the compound artificially. As a result, large

quantities could then be made relatively easily and quickly. Synthetic pheromone was subsequently used in laboratory tests, which showed that the synthetic compound was just as attractive as crude extracts of the pheromone from female roaches. Male cockroaches presented with the synthetic pheromone were lured to them within seconds. Subsequent trapping tests done in roach-infested pig farms showed very positive results.

Medium-term: Ten companies signed Material Transfer Agreements with North Carolina State University and have obtained synthesized pheromone as a potential commercial product for pest control use. These companies range from relatively small "niche" companies that specialize in pheromones and traps, to global agricultural and human health companies that sell to both professionals and consumers.

Long-term: More comprehensive understanding of the basic biological processes of lipids in insects, which could serve as a model system to predict how these lipids might function in related pest species (grasshoppers). The basic information funded by the NRI grant is paving the way for large-scale adoption of an environmentally safer technique to reduce or eliminate a serious pest which affects humans in rural areas.

6) A FY 2001 Hatch Project in conjunction with the North Carolina Department of Agriculture and North Carolina State University supported the development an Integrated Pest Management program for confined swine facilities. The goal was to develop monitoring methods, develop reduced risk approaches, including inorganic pesticides, biological control agents and innovative delivery systems to target cockroaches. The project included a survey of swine producers to generate data on pesticide use, patterns and management practices and attitudes about implementing an IPM program.

Short-term: The recommendations developed for the swine IPM program in swine facilities reduced the usage of insecticides to less than 10% of previous practices.

Medium-term: Adoption of IPM programs in several swine facilities in North Carolina and has facilitated the development of IPM policies for several schools. Additionally, streamlined methods have increased business ties between pest management companies, consultants, the swine industry and municipalities.

Long-term: Model for wider adoption for IPM in swine facilities and municipalities in other states which will ultimately reduce the incidence of cockroach inflicted problems affecting people in rural areas.

7) Two HATCH projects improves understanding of the actual risk of a West Nile Virus (WNV) epidemic in Florida, and determining factors are associated with the spread of the disease. The PI received the USDA honor award for his contributions to controlling mosquitoes and other arthropod diseases and vectors. The first project (*Develop Methods for Predicting Human Epidemics of Mosquito-Borne Encephalitis Virus in Florida, 1996–2001*) was one of the first in the US to determine actual WNV transmission rates through intensive field surveillance of

mosquito and wild avian populations. The project developed a state-wide arboviral surveillance program for mosquito vectors of WNV. The second project (*Predicting Mosquito-Borne Disease Transmission in Florida*; 2001-2006) identified periods when risk of disease transmission was unusually high in Florida, and evaluating the major biotic and abiotic factors responsible for arboviral transmission of WNV. Sentinel chickens were used to measure viral load and temporal transmission of WNV. Wild bird populations are being surveyed as well as to determine which species are responsible for rapid amplification of WNV.

Short-term: A surveillance program was established, and included measures of viral abundance; vector abundance, age, and infection status, as well as wild vertebrate amplification host abundance, age and infection status. In 2001, this project's surveillance system detected a WNV transmission event in Florida.

Medium-term: Arboviral transmission risk maps were constructed, updated, and posted on publicly accessible internet websites as part of the Encephalitis Information System, and a state-wide long-term surveillance program was established. In 2002, an Arbovirus Rapid Deployment System (ARDS) was used to evaluate the risk of a WNV epidemic in Florida. The ARDS protocol was used to quickly establish actual WNV transmission rates in selected areas.

Long-term: ARDS' protocol quickly established the actual WNV mosquito transmission and infection rates for 5 field sites to be less than 1:1000 (which is the accepted cutoff rate for epidemic transmission). The surveillance program will ultimately help with the creation of mathematical models, which will form the basis of predictive risk maps that can be used to track and predict vector-borne disease outbreaks in humans, domestic animals, and wildlife in other regions of the U.S.

8) A 1998 - 2003 HATCH project (*Detection of Tick-Borne Infections in Connecticut*) was awarded to study the prevalence and distribution of Lyme disease and Human Granulocytic Ehrlichiosis (HGE) in the eastern U.S. In continuance of the original HATCH project, a second HATCH project (*Analyses for Tick-Borne Infections*; 01 Apr 2003 – 31 Mar 2008) is currently underway to develop and evaluate new antibody assays for humans as well as a variety of animals, and determine the prevalence of tick-borne infections in Connecticut.

Short-term: HGE is more widely distributed in the eastern US than previously thought. Antibody tests revealed that HGE-infected rodents occurred as far south as Florida and as far north as Connecticut. They also confirmed that deer and rodents are key reservoir hosts for both HGE and Lyme disease in Connecticut, and found that HGE was in domesticated horses. Furthermore, they discovered new protein antigens which are specific to HGE, and identified the most diagnostically important antigens specific to Lyme disease.

Medium-term: The identified protein antigens were used to develop more sensitive and specific diagnostic tests to detect HGE and Lyme disease. Specifically, enzyme-linked immunosorbent assays (ELISAs) were developed to detect antibodies to the HGE pathogen in human sera.

Long-term: Diagnostic tests have improved the detection of antibodies and laboratory confirmation of HGE and Lyme disease in humans and domestic animals, and are currently being used in at least two major diagnostic laboratories such as Department of Public Health and Yale University in Connecticut.

9) In 2003, The National Center for Biodefense Communications in Mississippi formed a collaborative public-private partnership with Federal research laboratories (Lawrence Livermore and Sandia National Laboratories), universities with teaching programs (specifically targeting minority students) in public health, veterinary science, and informatics / related subjects, non-profit corporations, and technology firms through CSREES' Federal Administration grant program (2003-2004). The objective of this strategic initiative was to establish internet-based technologies with which to issue secure bioterror alerts to authorized policymakers, healthcare / veterinary professionals and first-responder recipients in rural regions of the U.S.

Short-term: Researchers found a very low need for veterinary medical practitioners in Mississippi to send or receive alerts from law enforcement and first responders. It was determined that this sector would not benefit from an Alerts & Notification Function. However, further research showed that there was a very high need for veterinary laboratories to send and receive confidential information associated with diagnostics they are performing, which they were accomplishing through low bandwidth network.

Medium-term: Based on feedback from veterinary medicine focus groups, the Mississippi State Veterinarian and the State Animal Diagnostic Laboratory, a Directory Function with an Alerts & Notification Function has been created.

Long-term: After implementation of the Alerts & Notification Function, the Mississippi State Veterinarian has suggested that this function be used to facilitate and secure communications among and between State Veterinarians in all 50 U.S. states and potential for the communications network to be expanded to include secure communications with Federal agencies, including USDA and Center for Disease Control. When this project is completed, The Center will provide secure and reliable cross-sector, nationwide messaging to national public health professionals and veterinary communities with the intent of realizing practical outcomes in connection with Homeland Security and human and animal health as well as safety of U.S. agriculture. The center will serve as a model for other rural regions of the US.

10) Three Hatch grants and two Special grants were awarded between 2001-2004 to conduct research and extension projects with the Lyme disease tick. These projects resulted in a statewide tick surveillance program, development of a climate-based risk model, compilation of tick control strategies by surveying vector control and health professionals, information gathering from potential users of the tick risk index and community wide dissemination of tick bite mitigation information. In addition, molecular studies are also being done to determine which genes in ticks are important in the transmission of the spirochete.

Short-term: Increased understanding of how particular environmental parameters (e.g., soil moisture) affect survival and activity of ticks and raised public awareness about the relationship of vertebrate reservoirs with infection and transmission risk to humans. Discovered which genes are involved in secretion of the spirochete from tick saliva, which may be influence the ability of ticks to transmit Lyme disease to humans.

Medium-term: Developed a predictive model which aims to influence the level of disease risk by incorporating behavioral change techniques in individuals. A web-based information system was being developed to disseminate information to the public about ways to avoid tick bites and disease prevention strategies. Molecular studies led researchers to target specific genes to target for future studies using gene silencing techniques such as RNAi to inhibit expression of proteins involved with exocytosis.

Long-term: This model has been used to direct the development of unique targeted tick control strategies and is currently being used to investigate transmission risk and transmission thresholds. The overall goal is to develop a public health action framework to prevent tick-transmitted diseases in Rhode Island and to develop an infrastructure for implementing community based tick control programs. The long-term goal of molecular studies is to genetically transform ticks so that they will become unable to transmit the disease to humans.

11) Hatch Funds were awarded to the University of Hawaii to study invading insects and other arthropods to help solve crimes. In the case of certain homicides or suicides where the body is not immediately discovered, forensic entomology frequently must be used to establish the time since death. A series of controlled studies were done to determine the effects of burning of a corpse on which types of insects colonized these human remains.

Short-term: Surveys of insects and other species which invade human corpses made criminal investigators aware of the importance of gathering this type of information at crime scenes. It was discovered that a certain set of insects and other species characteristically inhabited these burnt corpses at specific time periods after death. Types of species that were found when the body was discovered could help investigators establish when death or when burning of the corpse occurred, which is critical information needed to solve homicide and suicide cases.

Medium-term: These data are being used by law enforcement agencies in Hawaii for development of protocols for evaluating homicides or suicide cases involving burnt corpses

Long-term: Data from projects were applied in over 200 cases in Hawaii and other parts of the U.S. Training sessions detailing these techniques were presented to law enforcement agencies on local, national (FBI) and international (Brazil, Spain, Italy, Australia and New Zealand) levels.

SUCCESS STORIES

Termite "fingerprints." Researchers in Hawaii have applied molecular genetic techniques, including DNA fingerprinting to follow the path and spread of termites from one location to another. Termites cause over \$100 million in damage to household structures in Hawaii, and over 2 billion to structures across the US. By observing the "barcode" of DNA, the researchers can define the boundaries of a termite colony and monitor the spread of toxicants throughout the colony to be sure bait is working to control the infestation. If the pests should reappear after treatment, Louisiana State University and NC State University research showed that this technique helps determine if the termites are a new infestation or a recurrence. This technique has led companies that manufacture termite baits, to require both experimental use permits and commercial protocols that termites from infestations be sampled for DNA fingerprinting once bait is applied for control purposes. It is now possible to determine if re-appearing termites are remnants of the same colony or invaders from adjacent colonies. These techniques are currently being used in several regions of the US to ensure that new pesticides work to control termites and that baits are being applied properly.

Termite "colony elimination system." Researchers in Florida identified, tested and patented new termite bait and the baiting system is now marketed under a licensing agreement to Dow Agro Sciences. Over 150,000 homes were protected from subterranean termite termites using the Sentricon® system which is a monitoring-baiting program that relies on a routine monitoring for early detection of termite activity. The Sentricon® Colony Elimination System is now extensively used world-wide by pest management professionals. For example, The Sentricon® System now protects many homes and historical structures around the world including the Statue of Liberty, the White House, Independence Hall, The Senate Building in Italy, Casa das Rosas in Brazil, and Darling Harbor in Australia. In 1996, Agriculture Secretary Dan Glickman presented Dr. Nan-Yao Su, the lead researcher at the University of Florida, Department of Entomology, with a Secretary of Agriculture Honor Award, the USDA's highest recognition for outstanding contributions to agriculture and the consumer.

NEW DIRECTIONS

Increased world trade of commodities has offered the US great opportunities for opening up new economic markets. At the same time, it has caused us to be more vulnerable to the introduction of exotic or invasive species, which have resulted in the spread of zoonotic diseases into the US. In addition, intentional introduction of arthropods or other pests that have been genetically modified is a serious potential threat. CSREES is in a unique position to facilitate research, education and extension programs to address these new challenges.

Challenges in Human and Animal Health and Homeland Security

In 2003, The Council of Entomology Departmental Administrators (CEDA) proposed several initiatives which are relevant to CSREES' strategic goals. Two of the initiatives directly pertain

to the objective 2.2 (to provide science based technology, products and information to facilitate informed decisions affecting the quality of life for rural areas). These initiatives were Animal and Human Health and Homeland Security. Some of the areas of greatest priority for increased investments in research, education and extension programs included:

- Generate new tools for genetically identifying and manipulating populations of pathogen vectors
- Develop risk assessment protocols and biocontainment
- Explain the molecular interactions between vector hosts, pathogens and human and animal hosts
- Better understand vector behavior and ecology to exploit their vulnerability and time control measures
- Train students to be competent in recognizing vectors and disease pathogens so that we can respond to new introductions and bioterrorism threats quickly
- Increase our taxonomic capabilities, which include an arthropod and pathogen information database and reporting system on origins and locations of known and new species
- Modeling to predict the spread and survival of vectors and pathogens with potential to become biological threats

Increased Role of Social Science

The National Research Initiative (NRI) has recently become involved with the ESCOP Social Science group's initiative to better integrate the social sciences with NRI programs. Greater involvement of economists and policy makers focusing on rural issues in traditionally scientific review panels could potentially advance the needs of rural Americans. At the NRI retreat held in October 2005, program leaders discussed ideas to facilitate this multi-disciplinary activity into existing programs. Given adequate funding, an increasing level of interaction between the social sciences NRI programs may occur in the next 5 years. The following are just some of the areas that program leaders identified where social scientists are needed to advance the impact of our programs:

- Define mechanisms to increase social acceptance of introducing new technologies in food and agriculture:
- Include economic assessment (e.g., cost/benefit analysis) of pest control strategies
- Address the social or ethical consequences of a new technology (e.g., genetically modified organisms)
- Institutional and consumer acceptance and marketing techniques
- Behavioral modification methods

Increased coordination between extension and Public Health Initiatives

A third area where CSREES should play an increased role would be that of expanding linkages and coordination between Cooperative Extension and Public Health Agencies. Extension agents

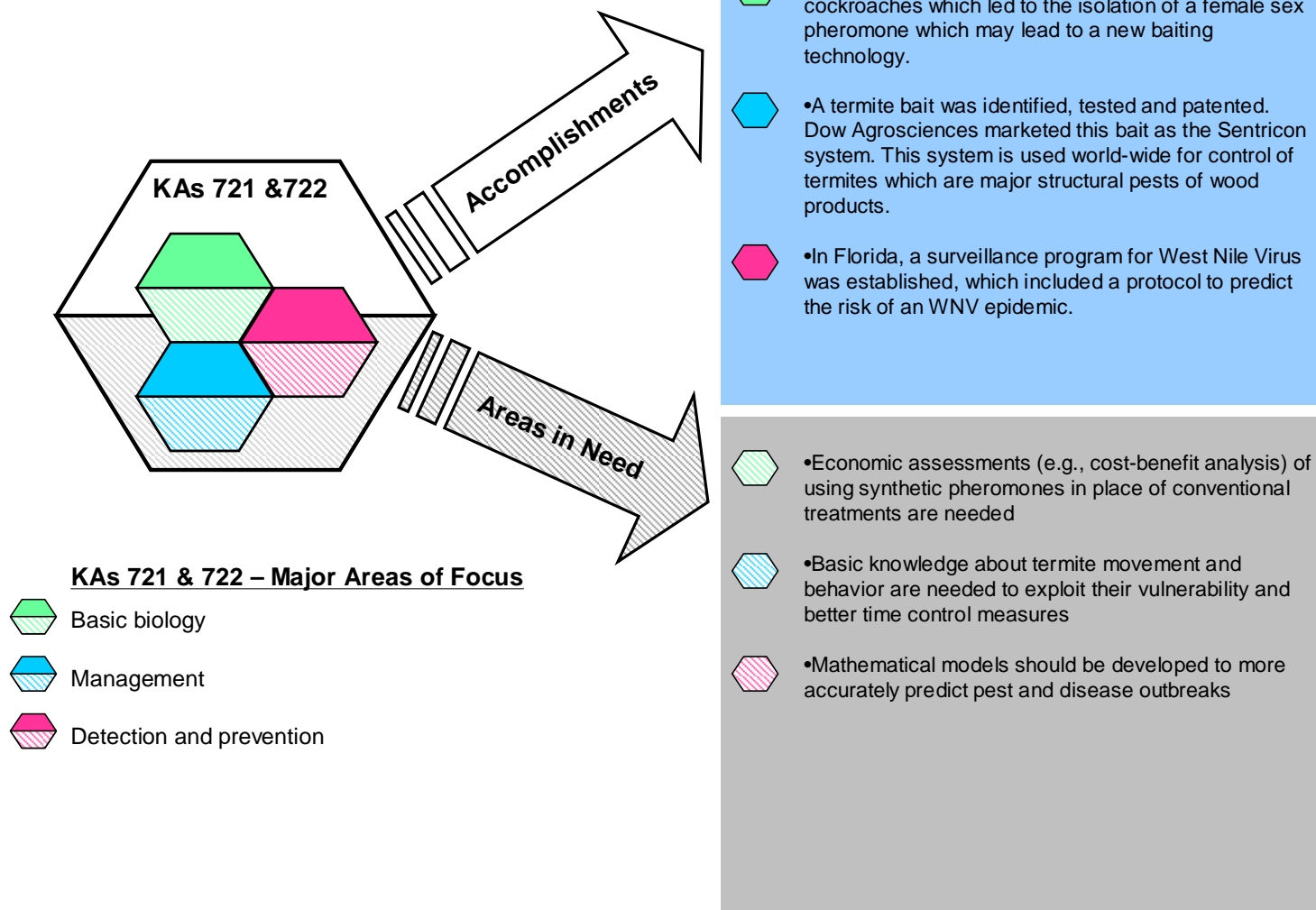
could provide expertise on the biology and management of human pests and zoonotic diseases to public health workers who may lack this training.

Several CSREES programs which support projects on zoonotic diseases, parasites, and arthropod pests will increasingly focus on these priority areas in the next 5 years.

Figure 12 illustrates selected examples of accomplishments and areas where greater emphasis is needed to advance our understanding of pests, diseases and parasites of humans.

Figure 12 - Honeycomb Model of Accomplishments and Needs for KAs 721 & 722

Knowledge Areas 721 and 722: Pests, Zoonotic Diseases and Parasites of Humans



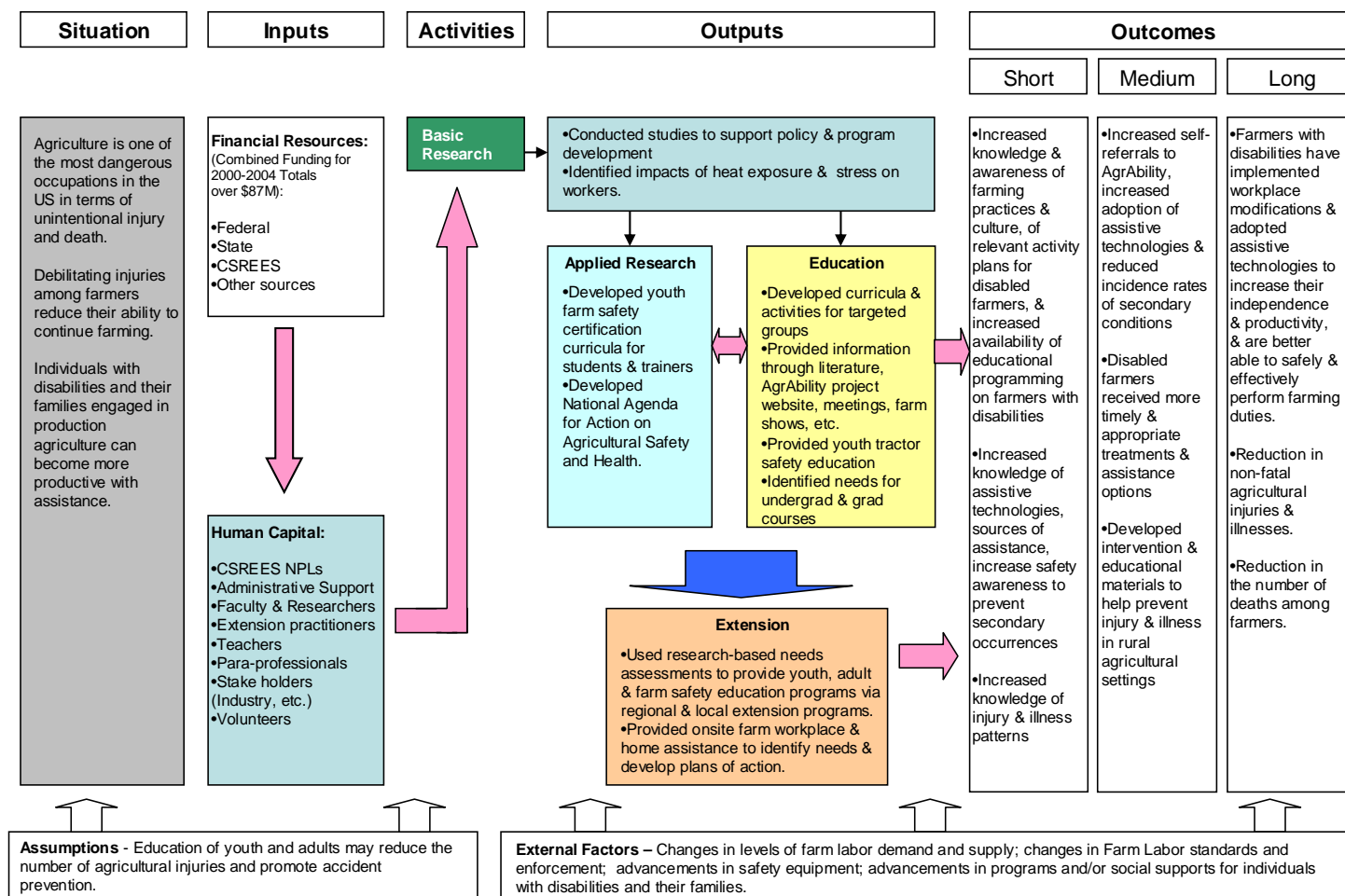
Knowledge Area 723: Hazards to Human Health and Safety

OVERVIEW

Agriculture is one of the most dangerous occupations in the US in terms of illnesses, unintentional injury and death. Work in this area is concerned with reducing hazards to the health, safety, and biosecurity of people engaged in the production, processing, and distribution of agricultural and forest products. CSREES emphasizes identifying immediate hazards to humans, researching effective ways to reduce agricultural injuries, illnesses, and deaths, and disseminating research findings into education and extension programs to make sure that new knowledge leads quickly to better health and earning power for workers.

Figure 13 – KA 723 Logic Model

**Portfolio 2.2 – Informed Decisions Affecting Quality of Life in Rural Areas:
KA 723 Hazards to Human Health and Safety**



SITUATION

Not only is agriculture one of the most dangerous occupations in the US in terms of illnesses, unintentional injury and death, but illnesses and debilitating injuries greatly reduce the ability for producers to continue farming. Education of youth and adults may help reduce the number of agricultural injuries and promote accident prevention. AgrAbility increases the likelihood that individuals with disabilities and their families engaged in production agriculture become more successful. The Hazardous Occupations Safety Training for Agriculture (HOSTA) Program supports national efforts to deliver timely, pertinent, and appropriate training to youth seeking employment or already employed in agricultural production. There are deep challenges to obtaining accurate data on incidents and causes of agricultural industry and illnesses. The socio-culture of farming reduces the adoption of protective/preventive practices in the industry. This poses a serious challenge to change.

ASSUMPTIONS

Farm safety specialists, stakeholders, and extension educators will work towards supporting current standards, conduct studies to support policy and program development, and develop programs to address special needs. AgrAbility programs will focus on three components: education, networking, and assistance. All programs will be dynamic, functioning in tandem with other federal agencies and considering stakeholder input and research results to direct the programs appropriately.

EXTERNAL FACTORS

External factors affecting program success include increases and decreases in funding, shifting priorities, changes in farm labor supply, demand, and regulations, advancements in safety equipment; and advancements in programs and/or social supports for individuals with disabilities and their families.

INPUTS

Figure 14 – CSREES Funding by Source for 2000-2004

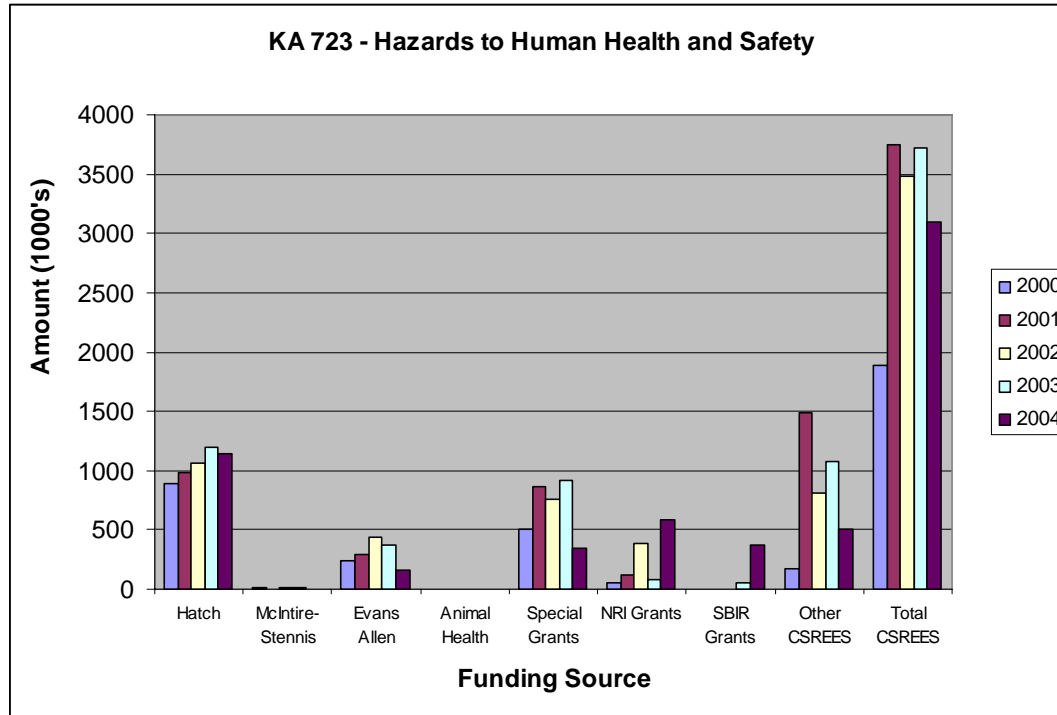


Table 11: Funding for KA 723, CSREES Sources

Funding Source	Fiscal Year (<i>in thousands</i>)					Grand Total
	2000	2001	2002	2003	2004	
Hatch	892	983	1,059	1,200	1,143	5,277
McIntire-Stennis	15	0	17	16	4	52
Evans Allen	238	286	440	369	154	1,487
Animal Health	6	2	1	1	3	13
Special Grants	507	859	760	922	342	3,390
NRI Grants	59	125	390	82	580	1,236
SBIR Grants	0	0	0	59	371	430
Other CSREES	171	1,487	816	1,072	502	4,048
Total CSREES	1,887	3,743	3,482	3,721	3,100	15,933

Table 12: Funding for KA 723, All Sources

Sources of funding	Fiscal Year (<i>in thousands</i>)					
	2000	2001	2002	2003	2004	Total
CSREES	1,887	3,743	3,482	3,721	3,100	\$15,933
Other USDA	98	140	320	588	529	\$1,675
Other Federal	2,024	2,384	3,931	7,515	9,389	\$25,243
State Appropriations	4,403	4,855	6,377	7,606	7,975	\$31,216
Self Generated	170	279	520	789	859	\$2,617
Independent/GR Agreement	816	1,128	1,279	1,362	1,444	\$6,029
Other Non-Federal	826	1,088	1,045	980	648	\$4,587
<i>Total KA 723</i>	10,226	13,617	16,954	22,560	23,945	\$87,302
CSREES as % of Total	18.45%	27.49%	20.54%	16.49%	12.95%	18.25%

Tables 11 and 12 reflect the research and education funding for KA 723 (CSREES Sources) and funding for KA 723 (All Sources) respectively. In Table 11, within CSREES, Hatch funds comprise the largest percentage of funding for KA 723. In fiscal year 2000, Hatch funding for KA 723 was \$892,000. The Hatch funding steadily increased to \$1.2 million in fiscal year 2003. In fiscal year 2004, Hatch funding was reduced to \$1.143 million. Special grants contributed the second highest funding percentages of KA 723. In fiscal years 2003 and 2004, there were five SBIR grants coding portions of their project into KA 723. There was a marked increase (607%) in NRI funding of KA 723 projects between fiscal years 2003 and 2004. This increase is logical, given the increased funding in general for NRI projects. Other CSREES funding levels have fluctuated over time.

An initial glance at Table 12 details a total of \$87.3 million in support of activities related to hazards to health and human safety from fiscal years 2000 to 2004. Of that total, 18.25% of the funding originated from CSREES. State appropriations accounted for 35.8% of the total funding and other federal sources accounted for 28.9% of the funding. During the reporting period, CSREES contributions peaked during fiscal year 2001 at 27.49% of the total funding and declined to 12.95% in fiscal year 2004. State appropriations for KA 723 have risen steadily, from \$4.4 million in fiscal year 2000 to \$7.9 million in fiscal year 2004. Other federal funding has increased 363% from fiscal year 2000 (\$2.0 million) to fiscal year 2004 (\$9.3 million). There has also been a positive trend for projects increasing self-generated funding amounts. During the reporting period, self-generated funding increased from \$170,000 to \$859,000, a difference of 405%. The largest percentage increase was between fiscal years 2001 and 2002 (86% increase). Overall, funding has increased for KA 723 steadily during the reporting period. In fiscal year 2000 funding was \$10.2 million. By fiscal year 2004, the funding had increased to \$23.9 million, a 134% increase in overall funding for hazards to human health and safety.

ASSISTIVE TECHNOLOGY FOR DISABLED FARMERS

The Assistive Technology Program for Farmers with Disabilities (AgrAbility) – State and Regional AgrAbility Projects increase the likelihood that farmers, ranchers, farm workers, or

farm family members with disabilities and their farms experience success. The program supports cooperative projects in which State Cooperative Extension Services based at either 1862 or 1890 Land-Grant Universities subcontract to private, non-profit disability organizations. Measures of success may include improvements in customers' financial stability or access to life activities and in the capacity of the states and regions to deliver services this population requires in a timely and satisfying manner. The program builds service capacity through education and networking. In the absence of capacity, projects provide direct assistance to customers. Projects use marketing to direct the public to initiatives in the priority areas of education, networking, and assistance. State and Regional AgrAbility Projects operate within a geographic area defined on the basis of counties, states, or both.

AgrAbility clientele include people who have experienced some form of disability, whether it is a long-term health condition or a catastrophic accident. Understanding the nature of the injuries/disabilities and current farm practices allows recommendation of expanded services. Disabilities most frequently reported by AgrAbility clients include paraplegia, back injuries, joint injuries, orthopedic injuries, arthritis, and upper and lower extremity amputations. Less frequently reported injuries include stroke, multiple sclerosis, quadriplegia, and visual impairment. AgrAbility clients are primarily associated with field grain crop production, livestock production, hay production, and dairying. Fewer clients are involved with agribusinesses, other animal production, vegetable production, poultry production, fruit production, and nursery/orchard production.

Twenty-five states have/had AgrAbility projects in the reporting period of 2000-2004. Also during this time period, 3917 clients have been directly assisted (on-farm consultations with opened cases) through the AgrAbility projects, with countless others indirectly assisted, by receiving requested information, attending trainings and workshops, and participating in educational activities.

OUTPUTS

Research

- Analyze demographic information pertaining to type and source of disability, type of agricultural occupation, and age.

Extension

- Provide onsite farm workplace and home assistance to identify needs and develop plans of action.
- Educate health care professional regarding AgrAbility and possible workplace modifications.

Education

- Developed occupational/physical therapist, farm group, and government service provider curricula and activities.
- Provided information to disabled farmers through literature, AgrAbility Project website, meetings, farm shows, etc.

OUTCOMES

Short-Term

CSREES funding helps to identify and fill key knowledge gaps related to agricultural disabilities, injuries, and general awareness. Funding supports production of publications and training documents. Funded programs increase knowledge of distribution of injuries among age groups, sources of injuries, and most commonly found injuries and disabilities. Funded projects increased awareness and knowledge of farming practices and culture, and of relevant activity plans for disabled farmers, coupled with increased availability of educational programming on farming with disabilities. Projects have promoted an increased knowledge of available assistive technologies, sources of assistance, increased safety awareness to prevent secondary conditions.

Medium-Term

CSREES programs resulted in the development of target-audience-specific materials and assistive technology, an increased number of self-referrals to AgrAbility, increased adoption of assistive technologies, and reduced incidence rates of secondary conditions. Disabled farmers will hopefully receive more timely and appropriate treatments and assistance options.

Long-Term

CSREES programs, in conjunction with other funding sources, have contributed to:

- Farmers with disabilities utilizing the developed materials and assistive technology to be successful on the farm.
- Farmers with disabilities implementing workplace modifications and adopting assistive technologies to increase their independence and productivity, hence being better able to safely and effectively perform farming activities.

DISCUSSION OF SPECIFIC EXAMPLES

1. National AgrAbility Project. Funded since FY 1991, the National AgrAbility Project (NAP) at University of Wisconsin, conducted a three-year data collection from

the State and Regional AgrAbility Projects in an effort to identify and describe client demographics and assistive technology needs. In 2004, the NAP finished analyzing and compiling demographics from the state and regional AgrAbility Projects.

Short-term: Illustrated the wide spectrum of client injuries, and a detailed description of the AgrAbility client base. Identification of injuries most commonly associated with AgrAbility projects is critical to project planning and success.

Medium-term: Armed with the initial results of the demographic analysis, project staff at NAP assessed curriculum and resource materials for appropriateness and usefulness. Knowledge of the most common types of injuries and the various groups of clients allows for better preparation of project staff and curriculum and assistive technology development.

Long-term: Over time, NAP staff will provide the most applicable information and resources to State and Regional Project staff, for the most common injuries seen among clients. NAP staff will also be aware of any trends and/or shifts in demographics that may require adjustment or tailoring of curriculum or resources for State and Regional project staff to use in trainings and working with clients. The old adage “knowing is half the battle” holds particularly true when working with the disabled farming population. Educational resources prepared by NAP staff to address the most frequent types and causes of injuries, including secondary injuries, serve to prevent some injuries from taking place in the future.

2. Colorado AgrAbility Project. The Colorado AgrAbility Project collaborated with Iowa State AgrAbility and the National AgrAbility Project to develop a system of peer support for disabled farmers and their peers. The peer support program was designed to be science-based and empirically evaluated. The curriculum is research-based, cognitive, and experiential. The curriculum revolves around identifying effective peer support, learning methods of connecting well and establishing rapport with other farmers/ranchers who have newly acquired disabilities, practicing and enhancing problem-solving and active listening skills, identification of signs of high stress, anger, and depression, and effective referral-making skills.

Short-term: The Colorado AgrAbility Project and National AgrAbility Project developed new volunteer application procedures and conducted an extensive literature search related to established peer support programs. Science-based method of screening and selecting potential participants ensures that volunteers have already come to accept their own disability, before attempting to interact with people with newly acquired disabilities.

Medium-term: In FY 2004, the Colorado AgrAbility Project director vetted the newly developed curriculum with the Iowa State AgrAbility Project. Materials were tested for effectiveness and practicality. Nine clients and caregivers participated in the training in

July, 2004. In May, 2005, nineteen staff participants from CA, IA, IL, IN, KS, MI, NE, OK, PA, and SD completed the training in a “Train-the-Trainer” setting. This progressive method of training has allowed expansion of the CO-developed peer support program into other State and Regional Projects, and reached more neighborhoods and disabled farmers/ranchers.

Long-term: In FY 2005, the Colorado AgrAbility Project director continued to provide support to other state and regional projects in developing peer support networks. Data collected from each training evaluation were analyzed and submitted to a refereed journal for publication. Widespread use of the Neighbor-to-Neighbor peer support training will help disabled farmers come to understand their disabilities; ideally, it will help them accept their disabilities.

3. Iowa AgrAbility Project. Generating awareness about disability and assistive technology can be difficult for many rural service providers. The Iowa AgrAbility Project, in conjunction with Iowa State University has assisted in developing the Universal Design Learning Laboratory (UDLL). The UDLL features accessible, life-sized household rooms with appropriate assistive technology mechanisms. Staff and interested persons tour the UDLL and presentations are made regarding each room and the accommodation.

Short-term: In FY 1998, “Home for All Ages,” a traveling interactive exhibit that features a full-size living/sleeping room, kitchen, and bathroom, was used to demonstrate universal design and home accessibility. Workshop participants who had disabilities received individual consultations to discuss their accessibility concerns. The exhibit was primarily constructed for the 1990 Farm Progress Show.

Medium-term: In 2001, a grant through Iowa State University made it possible to install the exhibit on the ISU campus as part of a Universal Design Learning Laboratory. The money funded additional new features and assistive devices. The exhibit can still be taken on the road to major fairs and expos, but Iowa AgrAbility clients could also visit the exhibit in person at ISU and discuss accessibility options with staff on site. UDLL made it possible to bring in groups of rural service providers to increase awareness regarding assistive technology, universal design, and AgrAbility in general. The service providers, in turn, better serve their clientele, and were able to make an educated decision when referring clientele to AgrAbility.

Long-term: The UDLL on ISU’s campus has been expanded to include an office and child’s bedroom. Additionally, a traveling bathroom exhibit was developed, including a roll-in shower and a transfer shower. A traveling kitchen exhibit was developed with modular components that can be adapted easily with simple tools to accommodate people with a variety of heights, ages, and abilities. Through the efforts of the ISU UDLL and AgrAbility, many people have been exposed to assistive technology and universal design.

The awareness generated by these ever-evolving exhibits is critical to the success of the Iowa AgrAbility program and quality of life of the Iowa AgrAbility clients.

SUCCESS STORIES

1. **AgrAbility for Pennsylvanians.** AgrAbility for Pennsylvanians, funded since 1991, is a partnership between Pennsylvania Cooperative Extension (PSU) and Easter Seals Central Pennsylvania (ES). Staff have established relationships with student groups and volunteer organizations to help strengthen AgrAbility's educational and direct client support. Three *Engineering Projects in Community Services* (EPICS) teams completed projects in 2001 that benefited staff, clients, and the general public. Two EPICS teams of mechanical and electrical engineering students designed and build remote control lifts on two model tractors. The models are used at agricultural and health events and client site visits to demonstrate a working lift. Another EPICS team of four mechanical engineering students designed and built a model grain bin and gravity wagon. AgrAbility staff and county Cooperative Extension agents use the models at state and county events to show the dangers of flowing grain. The agricultural fraternities and sororities at PSU organized and sponsored an annual Penny War. The event raises funds for an AgrAbility farmer to make necessary on-farm modifications. The Susquehanna Valley Mall supports AgrAbility through their annual Fall Farm Fun Fest. AgrAbility staff described the relationships with outside organizations as a positive method of including additional program resources, educational opportunities for both the public and volunteers, and financial assistance and information for AgrAbility clients. One is a man who suffered a stroke at age 56. The stroke affected much of his right side and hindered his outdoor farm work on his dairy. AgrAbility staff performed several onsite assessments of the dairy and suggested a variety of modifications for his operation. The staff connected the farmer with the PA Office of Vocational Rehabilitation, which provided the financial assistance for him to make the improvements to his milking system.
2. **AgrAbility of Wisconsin.** AgrAbility of Wisconsin is a partnership between University of Wisconsin-Extension Cooperative Extension and the Easter Seals Wisconsin Farm Assessment and Rehabilitation Methods program (FARM). Since 1991, the collaborative efforts have allowed AgrAbility of Wisconsin to serve over 1000 clients. In 2003, Easter Seals and FARM program staff entered into an agreement with the Wisconsin Department of Vocational Rehabilitation (DVR) to provide training to DVR staff, outreach to potential consumers, and services to DVR consumers. Under the agreement, FARM staff provided 72 farm assessments in 2003. The trainings provided information relating to the issues farmers face and cultural aspects of farm family life. The trainings identified special challenges that DVR counselors typically face when working with farmers. Ultimately, the trainings resulted in an increase in clients, a decrease in the amount of waiting time experienced by new clients, and a joint increase in available collaborative resources.

3. **Minnesota AgrAbility Project.** The Minnesota AgrAbility Project was established in 1991. The project is a partnership between the University of Minnesota Extension Service, Rural Rehab Technology, Inc., and Goodwill/Easter Seals Minnesota. The project serves all 187 counties in Minnesota. The Minnesota AgrAbility Project provides information and referral, on-site visits, individualized assessment, education and supports services for Minnesotans with disabilities whose goal is to gain or maintain farming and/or farm-related occupations. The project clientele include farmers, farm family members, agricultural workers, rural health care providers, and agri-business leaders. The Minnesota AgrAbility Project conducts outreach through educational presentations, regular mailings, collaborative service agreements, the Fenceline (peer support network), and most importantly, on-site visits. Minnesota AgrAbility Project staff understand that farmers place a high value on interpersonal networks for securing information. By expanding the number of opportunities to meet with farmers one-on-one or in small groups, the effectiveness of training and educational programs has increased, particularly in the areas of preventing secondary injuries and disability accommodation training. Project staff used opportunities to make presentations at meetings and events of pre-established groups (e.g., traumatic brain injury and arthritis support groups, Farm Bureau, and seed dealers) and within pre-existing health care systems (e.g., cardiac care programs, diabetes regional centers), thus increasing the credibility and accessibility of AgrAbility resources to farmers and agricultural workers. Minnesota AgrAbility Project staff have partnered with Lifease, Inc. to conduct a feasibility study on the conversion of PC-based assessment software to PDA format. The end goal of this partnership is efficient and effective assessment. The PDA formatted software would enable persons making an on-site visit to quickly access a multitude of assistive technology databases and resources, based on the results of the initial assessment tool.

NEW DIRECTIONS

Beginning with FY 2006, state and regional AgrAbility projects will be able to apply for up to \$200,000 per FY, an increase of \$50,000 per year to allow projects more flexibility in increasing service areas, furthering education and consultation efforts, and ultimately serving the clients.

Assistive technology for disabled farmers evolves with time. New technologies make it possible for more farmers than ever to continue to farm safely and successfully with their disabilities. The AgrAbility program focuses a concerted effort on preventing secondary injuries, which may occur after and even as a result of the initial disability. AgrAbility staff work by the motto “do no harm.” Their careful attention to detail will be even more important as new technologies are introduced.

FARM SAFETY

Farm safety research, education, and training for youth and adults continue to be a cornerstone in the Hazards to Health and Human Safety portfolio. Youth farm safety programming is funded through the Hazardous Occupations Safety Training for Agriculture (HOSTA) grant program.

The HOSTA program supports national efforts to deliver timely, pertinent, and appropriate training to youth seeking employment or already employed in agricultural production.

HOSTA's funding has appeared under the Smith-Lever 3 (d) line for Youth Farm Safety Education and Certification since 2001 (see Table 13). The program has critical ties to the current regulations for employment of youth in agriculture especially the exemptions provided in 29 CFR Part 570, subpart E-1 for youth under the age of 16 employed in some agricultural occupations having obtained certification.

Table 13 – HOSTA Funding

Fiscal Year	Funding Amount
2001	\$478,944
2002	\$479,040
2003	\$475,927
2004	\$425,634
Total 01-04	\$2,282,375

Significant changes in agricultural production, and in the agricultural workforce since this Hazardous Order (HO) was implemented in the early 1970's, have encouraged the USDA to work with the U.S. Department of Labor in considering innovative training and certification and also in developing appropriate training and restrictions concerning youth employment in hazardous agricultural jobs.

The HOSTA program has the following three objectives:

1. **Support Current Standards** – Support existing HOs by updating and assessing curricula, testing, procedures, and certification means. Determine resources required to maintain a national certification program.
2. **Conduct Studies to Support Policy and Program Development** – Research the effectiveness of current HOs, and the health, labor, and economic impacts of altering current HOs. Study employment trends in the employment of youth in agriculture, and skills needed in agriculture that will impact the education and certification needs of youth.
3. **Develop Programs to Address Special Needs** – Identify and develop educational programs that mitigate agricultural hazards to young workers, regardless of their knowledge, experience, ability, ethnicity, or culture.

From fiscal years 1975 to 2004, formula funding through the Smith-Lever 3(d) Farm Safety line item was available to states and territories to provide farm safety training to adult and youth clientele. The funds served as seed money provided to state land grant universities to establish farm safety programs and leverage other funds. In 2003, the program provided an extra measure of support to 1862 land grant universities partnering with 1890 or 1994 institutions. Seventeen 1862s participated in the program, yielding twelve 1890 and six 1994 partnerships. Programs submitted five-year plans of work and reported annually.

Programs reported the numbers of staff involved with various committees, funding, products and presentations developed for the program, the numbers of youth instructed, the numbers of youth Hazardous Occupation certified, as well as narratives describing the program's history and success stories. Focus areas in each state's farm safety program vary depending upon region and need. Some common themes include machinery (including tractor) safety, all-terrain vehicle (ATV) safety, pesticide use, emergency response, livestock handling, bilingual safety training, homeland/farm security, resource development, West Nile virus, and ergonomics.

From 1998 to 2004, staff involvement in the program and on related committees has increased. The number of publications produced by farm safety programs also increased during this time period. There was a decrease in press releases made by staff from 2003 to 2004. Reasons for this are hypothesized to be an increased use of the internet, thus fewer radio or newspaper spots. There was a steady increase in in-kind state funding from 1998 to 2004, and a slight but constant increase in funding from other sources (federal and non-federal). Actual state funding remained relatively constant from 1998 to 2004. The numbers of youth instructed rose steadily from 1998 to 2002, and then tapered back to the 1998 figures. The numbers of youth Hazardous Occupation certified also peaked in 2002. (See Table 13)

The following barriers to showing impacts were identified: 1) broad program scope: Activities not related to occupational health and safety may have been reported; scope was so wide that it was difficult and overwhelming to collect outcome data on all activities; 2) terminology: commonly misinterpreted terms were farm safety, minority, underserved population; and 3) USDA funding was not directly linked to performance, which may have resulted in incomplete, inaccurate, or inconsistent reporting and less frequent sharing of success stories and impacts with CSREES.

Overall, based on the data provided and available, the program remained strong up through 2004. It is believed that a 100% reporting requirement on all indicators would have definitively illustrated the program's strength.

OUTPUTS

Research

Research outputs include development of youth farm safety certification curricula for students and trainers. The curricula covers topics related to agricultural safety and assists

trainers in preparing youth to become Hazardous Occupations certified. Researchers from funded projects have also developed a survey instrument to determine appropriate skills for 12-20 year-olds employed in agricultural work. Knowledge of these skills will help determine what agricultural activities are appropriate for each age group of youth.

Extension

Extension educators participating in funded Farm Safety and HOSTA projects facilitate farm safety educational programs for youth and adults. Using a variety of instructional methods, extension educators impart knowledge through hands-on learning and demonstrations.

Education

Providing youth tractor safety certification and education to youth working in agricultural occupations is critical in preventing accidents before they happen. Adult farm safety education is also important. Farm safety programs provided instruction to farmers regarding bio-security, on-farm rescue, hazards to working in enclosed spaces, and safe pesticide use and storage.

OUTCOMES

Short-Term

Increased knowledge of the Hazardous Occupations Orders for Agriculture and awareness of the requirement for youth education and certification to operate certain pieces of machinery. Identification of appropriate tasks/skills for youth employed in agricultural work.

Medium-Term

Increased numbers of youth completing the certification course, including passing the exam. Allowing youth under 16 to participate in certain agricultural tasks. The program developed a national database for management of curriculum and record-keeping of certified youth and instructors. This database and website serve as a reference and source of information for employers, instructors, parents, and students.

Long-Term

CSREES funded programs, in conjunction with other funding sources, contribute to:

- Reduction in non-fatal agricultural injuries and illnesses.
- Reduction in youth-involved agricultural injuries and illnesses.

DISCUSSION OF SPECIFIC EXAMPLES

1. Establishing a “National Safe Tractor and Machinery Operation Certification” Program. Educators and extension specialists at Pennsylvania State University identified and detailed the need for a national certification program to alleviate much of the discontinuity between and within state safety programs. Objectives included establishing and meeting with eight focus groups to determine the competencies, skills and certification requirements, determine and develop curriculum, conduct pilot training sessions in Pennsylvania and Ohio, conduct workshops and trainings for instructors, and make recommendations and establish guidelines for maintaining the national program.

Short-term: Project personnel were able to identify core competencies related to tractor and machinery safety. The competencies were grouped and expanded upon to develop task sheets. The task sheets served as an important curriculum component for the national program. Each task sheet is no more than four pages, with a consistent format, minimal text and a simple reading level, contains pictorials and/or illustrations, and can be used by many different people/groups, regardless of age or experience level.

Medium-term: Using the task sheets and curriculum, extension educators conducted workshops geared towards safety instructors. The instructors were made familiar with the task sheets and the content. State safety specialists reviewed materials and participated in the training program activities. The state safety specialists were also asked to identify approximately two people per state to participate in a train-the-trainer program. The goal was to have approximately 100 people capable of conducting trainings for safety instructors using the developed materials. The trainers then returned to their home states to conduct programs and distribute materials.

Long-term: The curriculum for the National Safe Tractor and Machinery Operation Certification program is readily available. The materials are in their third revision and have been accepted by many instructors. The task sheets have been evaluated as easy to follow, particularly in an agricultural education classroom setting. With this established curriculum, it is possible for some degree of continuity among and within states, in regards to core knowledge and skills deemed to be necessary for the safe operation of tractors and other farm machinery.

2. Development, Implementation, and Evaluation of a Model Administrative Management System for the HOSTA Program. The purpose of this program, conducted at Purdue University, was to create a national certification clearinghouse and administrative management system for the HOSTA (Hazardous Occupations Safety Training for Agriculture) Program. The goals of the project included: to increase public awareness and understanding of the implications of receiving certification in the safe operation of tractors and farm machinery; to prepare certification administration standards and a clearinghouse adaptable to all states which would effectively test basic knowledge of working hazards in production agriculture and establish minimal

proficiency in the operation of tractors and other machinery; and to develop a program administration management system and fee structure to fund public awareness, examination relevancy efforts, and instructor training.

Short-term: A website was developed to promote utilization of new and existing curricula and other educational resources specifically for use in the tractor and machinery safety certification program. News releases and other media notices were developed to educate the public about the Hazardous Occupations Order for Agriculture and the importance of youth being certified under the stated conditions. Database framework was developed to house the instructor information, listing of certified students, and testing materials.

Medium-term: The website and the HOSTA Program were promoted at national and regional trade shows. Two interactive exhibits were designed, allowing event participants the opportunity to immerse themselves in the program. Project personnel staffed the exhibits at trade shows and were available to answer questions and gather feedback and data. News releases were distributed for use by media outlets. Interest and awareness was generated for the program.

Long-term: The model administrative system has made it possible for employers to search and determine if a particular youth has obtained certification. It has made it possible for a youth to search for an available offering of the tractor safety program. It has enabled instructors to make it known that they are offering courses, and when/where those courses are held. Enhancing awareness of available educational offerings across the country through media resources has laid the groundwork for enabling the success of the HOSTA Program.

3. Minnesota Farm Safety Program. From FY 2000 to 2004, the project personnel for the Minnesota Farm Safety Program have focused on a project to help communicate the North American Guidelines for Children's Agricultural Tasks (NAGCAT) to Hmong immigrant families, as well as other cultural and ethnic groups. A significant population of Hmong immigrants, originally from Southeast Asia, has settled in the Twin Cities area.

Situation Statement: Given the growing population of immigrants into Minnesota, a need was identified for a more appropriate method of teaching the NAGCAT guidelines to Hmong and other cultural groups.

Short-term: Project staff spent considerable time with Hmong farmers. The NAGCAT guidelines were translated into Hmong folk tales, designed to be "performed" in a live setting. The performing of the live folk tales increased knowledge of the NAGCAT guidelines as well as created a bridge between the Hmong and non-Hmong populations.

Medium-term: The process has enabled farm safety staff to establish a protocol and procedure for ethnically-adapting material, thus increasing the degree of communication

and understanding between different ethnic or cultural groups. Other curriculum/learning materials may be adapted similarly using the developed method.

SUCCESS STORIES

From 2001 to 2004, a special grant-funded project in North Carolina has carried out research focused on evaluating and addressing the occupational and environmental health and safety issues unique to farmers, foresters and fishers, and their employees and families. This is a collaborative project including North Carolina State University, East Carolina University, and the North Carolina Agromedicine Institute. Agromedicine is a broad term describing a professional medical specialty related to agriculture. The long-term objectives for the research project are to develop a model for collaboration, incorporating interactive video conferencing to maximize the collective expertise of the academic centers and their diverse partners; to establish a comprehensive database of injury and illness specific to farmers, fishers, foresters, and their families; validate assessment, intervention, and evaluation protocols; and to develop educational methods for the dissemination of health information, including research project outcomes. More specific goals included determining the magnitude of heat related illness in North Carolina; evaluating existing heat index monitoring tools suitable for field deployment; implementing a monitoring program at three farm sites in 2001; making recommendations for future interventions and educational programs based on study outcome; and incorporate tracking of heat-related illness into an “occupation specific” health database.

The researchers convened a panel of experts in epidemiology including Agromedicine Institute member universities, government agencies, and cooperative extension. The group reviewed the existing survey tools and data collection activities in NC. Upon evaluation of currently available heat index monitors, engineers at NC State University and NC Agricultural and Technical University agreed to modify and/or redesign the monitors as needed. Nursing students were recruited and trained to interview participants and take the required heat measurements in the field.

Data collection took place from 2001-2003 and included farms both with and without migrant worker populations. Presentations about the project have been made to the NC Department of Labor, the North American Agromedicine Consortium, and the International Nursing Research Congress.

The results of the heat-related illness assessment study have laid the groundwork for successful funding of a heat-related illness intervention project by the National Institute for Occupational Health and Safety as part of a Southern Coastal Agromedicine Center Grant. This research and intervention will lead to better protection of field workers during extreme heat conditions. Additionally, educational materials for Hispanic workers in Spanish are planned for the project.

The project is an excellent example of collaboration and pooling of resources and expertise to accomplish research applicable to any area where heat stress and heat illness is a concern.

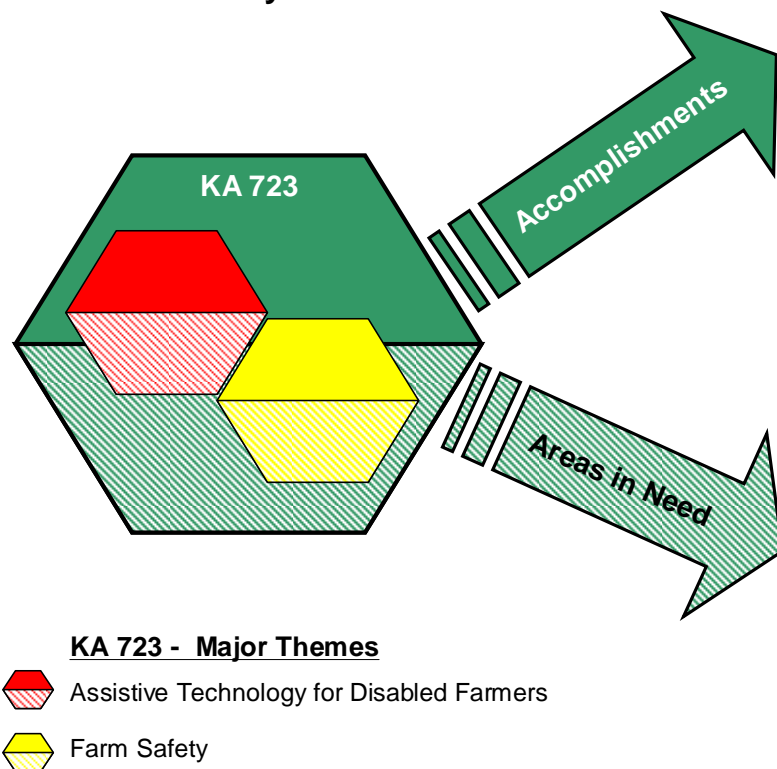
NEW DIRECTIONS





In 2000, the North Central Regional Administrators (NRCA) established the NCR-197 Committee on Agricultural Safety and Health Research and Extension. The goal of this committee is to more effectively use the land grant system's research and extension capacity in cooperation with the expertise of those who live and work in agriculture to reduce agricultural work-related injuries, illness, death, and property loss. The committee's work focused on developing a structure for gathering stakeholder input and identifying and coordinating priorities for the agricultural experiment stations and cooperative extension systems. The committee, comprised of representatives from 18 land grant institutions, USDA, and the National Institute for Occupational Safety and Health (NIOSH), developed the National Land Grant Research and Extension Agenda for Agricultural Safety and Health. The agenda describes the priorities in the agricultural safety and health field and provides recommendations for accomplishing all priorities.

The priorities are: sensor and guarding systems, operating agricultural equipment on public roads, agricultural confined spaces, emerging technologies, human factors engineering and design, management of agricultural emergencies, livestock handling and housing systems, public policy issues, capital and management intensive vs. family labor intensive operations, fire detection and suppression, agricultural safety education and training, and special populations and enterprises.

Figure 15 – KA 723 Honeycomb

Knowledge Area 723: Hazards to Human Health and Safety



- 
 - Identified and filled knowledge gaps related to agricultural disabilities, injuries and general awareness
 - Production of publications and training documents
 - Increased number of self-referrals to AgrAbility
 - Increased adoption of assistive technologies, and reduced incidence rates of secondary conditions
 - Disabled farmers utilize the developed materials and assistive technology
 - 
 - Improved ability of disabled farmers to safely and effectively perform farming activities
 - Increased awareness and knowledge of farming practices and culture, and of educational programming and relevant activity plans for disabled farmers
-
- 
 - More flexibility in increasing service areas, furthering education and consultation efforts, and ultimately serving the AgrAbility clients in programs
 - Ability of disabled farmers to continue farming safely and successfully
 - 
 - Reduce work-related injuries, illness, death, and property loss
 - Improvement in the accuracy and availability of data on accidents and illnesses.

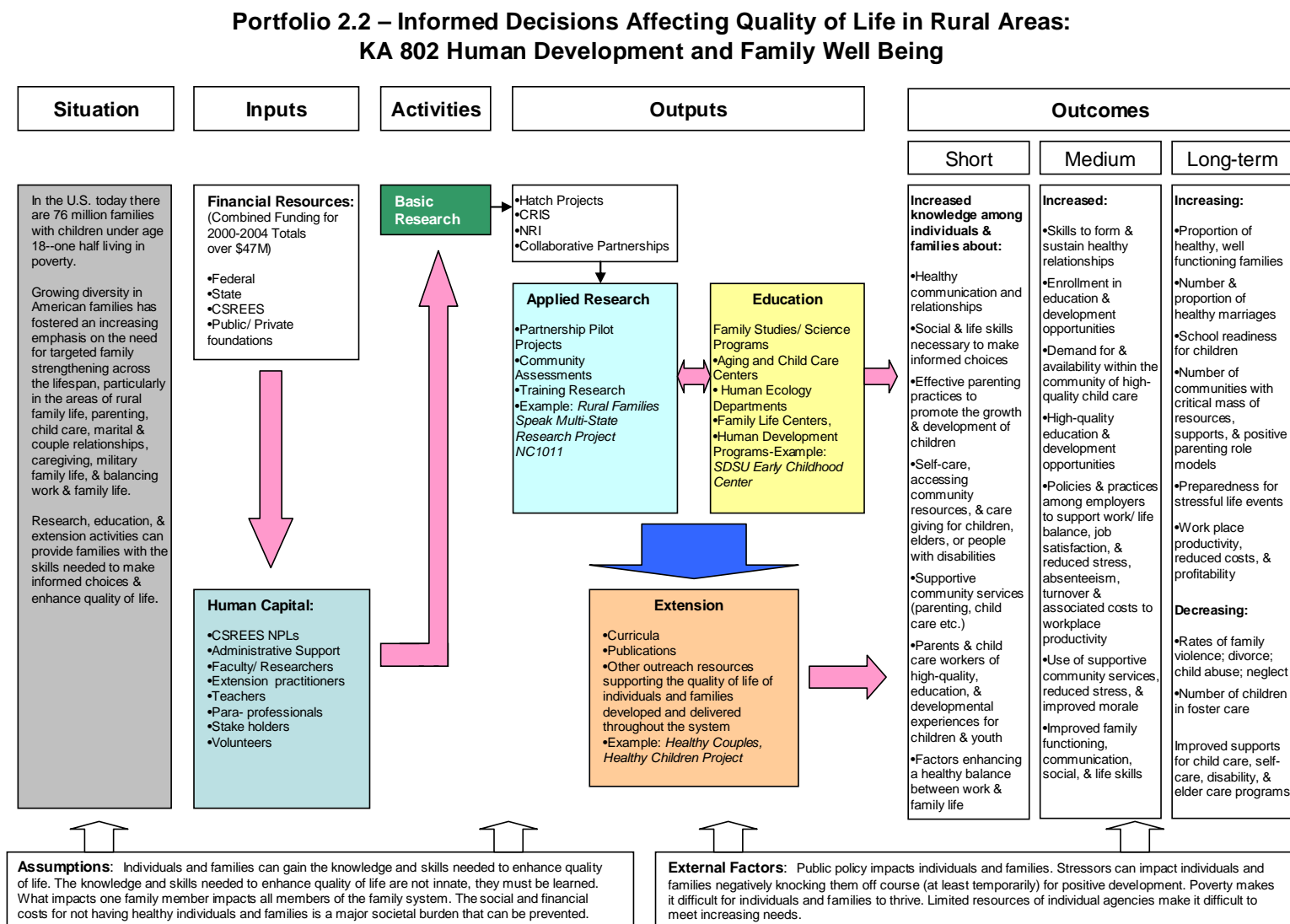
Knowledge Area 802: Human Development and Family Well-Being

OVERVIEW

Family life in the 21st century is immensely more complex than it was a century ago. Over the last three decades the American family has undergone a profound and far-reaching transformation. Both family structure and family values have been changing. As a result of these changes, household and family composition, family-related roles, and attitudes and beliefs about the family have changed (Smith, 1999). Changes in family life have exacerbated stressors associated with transitions in the life course and have a significant impact on individual and family functioning at home and in the community. These changes pose special problems for family members as they attempt to work, provide for the safety and well-being of children, care for aging relatives, and live healthy productive lives.

Among quality of life challenges families face are relationship issues, parenting, caregiving, health and safety, and balancing work and family life. Family members are interconnected and operate as a group--anything that happens to one member can potentially affect family functioning at home and in the broader community. Of the 111 million households in the U.S. today, 68 percent, or over 76 million are classified as family households (Census, 2003). The sheer number of family households, combined with growing diversity and the daily challenges they encounter, reinforce the importance of developing and delivering innovative programs to support the improvement of quality of life as families change over time.

Figure 16 – KA 802 Logic Model



SITUATION

The objectives of CSREES' work in Knowledge Area 802 are multi-faceted. Research, education, and extension work in human development and family well-being provides an understanding of the social, cognitive, emotional, and physical development of individuals and families over the lifespan and focuses on family and lifecycle studies. This work provides a contextual understanding of family systems, family performance, and the overall well-being of families in society. The work relates directly to the CSREES and USDA goals supporting the improvement of quality of life in rural areas. Although family needs and issues have changed, the work of the land-grant system in this KA is as relevant today as it was a century ago. Why?

- Of the 76 million family households in the U.S. with children under 18 years of age, half live in poverty.
- Seventy-two percent of mothers with children age one and older are in the work force.
- Twenty-one percent of the adult population in the U.S. provides unpaid/informal care to an adult family member or a friend.
- Nationwide, between one and two million children and youth between the ages of 8 and 18 are providing care for family members.
- Rural populations are aging rapidly as a result of aging-in-place, out-migration of young adults, and in-migration of older persons from metro areas.
- Over 2.4 million grandparents provide care to grandchildren who are living with them. (If even half of the 2 million children being raised by grandparents or other relatives with no parent present were to enter the foster care system, it would cost taxpayers \$6.5 billion annually and completely overwhelm the system.)
- Over 40,000 dual-military couples are raising children as they serve the nation and nearly 86,000 military members are single parents.
- Although divorce rates are declining in the U.S., trends indicate that couples who once might have wed and then divorced now are not marrying at all.
- American businesses lose between \$11 billion and \$29 billion annually in productivity costs due to workplace disruptions, short and long-term absences related to caregiving, and reduction from full- to part-time work, opting for early retirement, or leaving work entirely.

During the reporting period, CSREES funded 886 projects and activities that covered key aspects of human development and family well-being. This section of the portfolio highlights results of KA 802 research, education and extension projects occurring from FY2000 through FY 2004. Significant efforts were made to determine the extent to which work funded by CSREES has made a difference in supporting the improvement of quality of life in terms of the scope, scale, and effectiveness of human development and family well-being programming.

Knowledge Area 802 compliments and is integrated with a wide variety of KAs in the CSREES strategic plan, and in particular, with ongoing research, education, and extension in KA 805/724 and KA 806:

- **Health Promotion** which addresses the development, quality, and functioning of community institutions, social services and activities related to healthy lifestyles, including maintenance of social, emotional, and physical health.
- **4-H Youth Development** which prepares young people to meet the challenges of adolescence and adulthood through a coordinated, progressive series of research-based experiences that help them to become socially, morally, emotionally, physically, and intellectually competent.
- **Children, Youth, and Families at Risk** efforts, which integrate the resources of the land-grant system to develop and deliver educational programs that equip limited resource families and youth who are at risk for not meeting basic human needs, to lead positive, productive, contributing lives.

ASSUMPTIONS

CSREES has a long history of providing research-based educational programs and community level outreach to enhance human development and family well-being. The system promotes family strengthening from the perspective that strong families raise children to become responsible, productive, and caring adults. Ensuring the well-being of families is the cornerstone of a healthy society and requires universal access to supportive programs and services. Child-rearing patterns are influenced by parents' understandings of child development and of their children's unique characteristics, their personal sense of competence, and cultural and community traditions and mores. Families are empowered when they have access to information and other resources and take action to improve their well-being. Experts working in this KA share a common commitment to develop and apply scientific knowledge surrounding the critical interplay between social, behavioral, psychological, physical, and economic influences impacting human development and family well-being over time. No one agency can do this work alone and effective and widespread collaborations among federal, state, and local agencies serve to maximize available resources to support human development and family well-being across the nation.

EXTERNAL FACTORS

Significant external factors impact the scope of research, education, and extension efforts provided by CSREES through its partners in the land-grant system who are working to help families make informed decisions; become self-reliant; improve their quality of life and well-being; and engage fully in the growth and development of their communities. These include:

- Structural shifts and competing priorities in the land-grant system.
- Limited resources of other federal, state, and community partner agencies to meet increasing and critical family needs.
- Public policies that impact individuals and families.
- High rates of poverty that make it difficult for families to thrive.
- Multiple stressors that impact family development.

INPUTS

CSREES provides national program leadership across the functional areas of research, education, and extension in KA 802. This program focus aligns with the CSREES strategic goal to “provide science-based technology, products, and information to facilitate informed decisions affecting the quality of life in rural areas.” Work in human development and family well-being provides a context within which to understand the synergy and balance necessary between all content specific domains (nutrition, health, economics, housing etc.) impacting development from infancy through late adulthood.

An understanding of these issues and related challenges is critical to any agency working to meet human needs. Funding for this work relies on formula funds for research and extension, fees for resident education, and grants from non-profit organizations, state and federal agencies, and foundations, and extensive collaborations between a variety of agencies at all levels. External funding for this program has increased as a result of the need to maximize resources and collaborations across agencies to meet critical needs, particularly through scientific research in land-grant universities and the educational outreach function provided through the Cooperative Extension System.

Table 14: Funding for KA 802, CSREES Sources

Funding Source	Fiscal Year (<i>in thousands</i>)					Grand Total
	2000	2001	2002	2003	2004	
Hatch	\$ 715	\$ 736	\$ 741	\$ 783	\$ 690	\$ 3,665
McIntire-Stennis	\$ 3	\$ 3	\$ 7	\$ -	\$ -	\$ 12
Evans Allen	\$ 181	\$ 183	\$ 211	\$ 305	\$ 312	\$ 1,192
Special Grants	\$ 44	\$ 44	\$ 43	\$ -	\$ -	\$ 131
NRI Grants	\$ -	\$ 28	\$ 368	\$ 119	\$ -	\$ 515
SBIR Grants	\$ -	\$ -	\$ -	\$ -	\$ 80	\$ 80
Other CSREES	\$ 8	\$ 703	\$ -	\$ 77	\$ -	\$ 788
Total CSREES	\$ 951	\$ 1,697	\$ 1,370	\$ 1,284	\$ 1,082	\$ 6,383

KAs 802 and KA 806 were originally combined. As the growth of work in KA802 necessitated the creation of the new KA806, the funding for KA802 and KA806 was divided to correspond to the alignment of projects. In Table 14 and in Table 22, CSREES funds initially aligned with KA 802 from formula funding lines (Hatch, McIntire-Stennis, Evans Allen, and Special Grants) have been divided between KA 802 (65 percent of the initial amounts) and KA 806 (35 percent). NRI and SBIR funding lines are competitively awarded and thus were not re-allocated.

Table 15: Funding for KA 802, All Sources

Sources of funding	Fiscal Year (<i>in thousands</i>)					Total
	2000	2001	2002	2003	2004	
CSREES	\$ 951	\$ 1,697	\$ 1,370	\$ 1,284	\$ 1,082	\$ 6,383
Other USDA	\$ 62	\$ 95	\$ 192	\$ 115	\$ 14	\$ 478
Other Federal	\$ 7,202	\$ 1,882	\$ 1,387	\$ 1,065	\$ 1,012	\$ 12,548
State Appropriations	\$ 3,330	\$ 3,494	\$ 3,994	\$ 4,150	\$ 4,520	\$ 19,488
Self Generated	\$ 1,623	\$ 164	\$ 216	\$ 209	\$ 129	\$ 2,340
Independent/GR Agreement	\$ 504	\$ 270	\$ 837	\$ 1,157	\$ 1,744	\$ 4,512
Other Non-Federal	\$ 577	\$ 514	\$ 385	\$ 383	\$ 316	\$ 2,174
<i>Total KA 802</i>	\$ 14,249	\$ 8,115	\$ 8,380	\$ 8,363	\$ 8,816	\$ 47,923
CSREES as % of Total	6.7%	20.9%	16.3%	15.4%	12.3%	13.3%

In Table 15 and in Table 23, some CSREES funding lines initially aligned with KA802 were re-allocated to KA802 (65 percent of the initial amounts) and KA806 (35 percent). The exceptions are “Other Federal Funding”, referring to specific funding for military programs and projects, and the self-generated funds. Both KA802 and KA806 had unduplicated direct military funding for programs and projects of each KA. The initial self-generated funds aligned with KA802 were split (KA802, 65%, KA806, 35%). However, KA806 also had self-generated funds from the 4-H Council.

Funding Analysis

Funding from CSREES for KA 802 work fluctuated within the FY 2000-FY 2004 period. There was an increase in the percentage of CSREES funding between 2000 and 2001, possibly due to a \$6 million dollar decrease in other federal funds during that timeframe. State appropriations for the work have increased steadily over the past five years. The proportion of program funding listed as other federal comes primarily from military sources (Department of Army and Air Force) to support military families through Family Advocacy Programs and Family Assistance Centers on military installations. Overall, nearly \$48 million dollars were allocated for research, education, and extension work to support the improvement of quality of life of individuals and families throughout the U.S. over the reporting period.

MAJOR THEMES

From 2000-2004, major themes and trends in human development and family well-being defined the work of land-grant family life experts. A discussion of specific examples will be detailed later in the report and includes the following thematic areas:

RURAL FAMILY LIFE

In rural areas, family life is at the core of the rural community. The functioning of the family is important not only to the immediate members, but also to the well-being and viability of the rural community. Tracking changes in rural families and providing appropriate and timely educational supports across time is vital in the face of changing economic conditions and federal and state policies related to public assistance and supportive community services impacting rural areas. Through a variety of projects, CSREES supports these efforts to address family needs in the changing rural landscape.

PARENT EDUCATION

Parent education serves the public good. Parents who lack an understanding of their children's developmental stages, who hold unreasonable expectations for their child's abilities, or who are unaware of effective discipline strategies, may be abusive or neglectful. Prevention activities such as parent education and parent groups provide many families the support to stay together and care for their children in their homes and their communities (DeBord, 2005). Parent education programs developed by the land-grant system provide support to parents to enhance parent-child relationships and strengthen families. CSREES works to provide resources and support to promote healthy parent/child relationships.

CHILD CARE

With a growing number of mothers in the work force, child care needs have grown tremendously in recent years. Increased education of child care providers significantly improves the care provided to children. The lack of affordable, accessible, and high-quality child care, school-age care, and teen programs has a negative effect on current and future educational attainment and employment for parents and children, the economy and family income, and physical and emotional environments in which people live. CSREES provides resources and program

leadership to the Cooperative Extension System-enhancing a nationwide response to challenges facing American children, youth, and families. CES, through the “Extension ‘CARES’ ...For America's Children and Youth National Initiative,” focuses on a vision that all children and youth are in safe, healthy, caring, and enriching environments when away from their parents (Valentine, 2005).

MARRIAGE AND COUPLE RELATIONSHIPS

There is mounting evidence that trends of increasing couple, marital, and family instability are negatively impacting children, adults, families, and communities. Healthy relationships, healthy marriages, and resulting family stability specifically benefit the physical, social, and emotional well-being of children and adults. There are linkages with workplace and community well-being indicators (e.g., lower turn-over, greater productivity, greater financial stability, greater community volunteerism, and greater community economic stability). In the context of unhealthy relationships and unhealthy and unstable marriages, there are greater incidences of physical and mental illness, maltreatment among family members, delinquency among youth, and community instability (Adler-Baeder, 2005). CSREES partners with the Department of Health and Human Services and the land-grant system to provide resources to support healthy relationships in families.

FAMILY CAREGIVING ACROSS THE LIFESPAN

Family caregiving occurs when one or more family members aid or assist other family members beyond what is required as part of normal, everyday life (Walker, Pratt, & Eddy, 1995). These relationships might include those who assist older adults, caring for family members with disabilities, and grandparents raising their grandchildren. CSREES partners with the Cooperative Extension System and the land-grant universities on efforts to enhance family caregiving across the lifespan through educational supports, community outreach, and family strengthening programs.

MILITARY FAMILY LIFE

Today's military families face a lifestyle that includes frequent deployments and increased family separations. These factors create stressful challenges that can impact military readiness. CSREES, the land-grant university system, and a variety of partners support military family quality of life through special projects designed to curb military family violence and support parenting, resources and materials to support family readiness for deployments, and funding for extension educators housed on major military installations to assist families and soldiers. Ongoing projects include: University of Maryland-Walter Reed Army Medical Center; Fort Bliss, Fort Hood-Texas A&M University; Operation READY-Texas A&M University and the University of California, and Cornell Army and Marine Corps Projects.

BALANCING WORK AND FAMILY LIFE

Most two-parent families rely on dual earnings. The traditional breadwinner-homemaker family accounts for less than 20 percent of families. Over 70 percent of mothers with children work at least part time. According to Kiger and Riley (2000), the dramatic increase in the percentage of women in the work force means that couples are reexamining traditional divisions of labor

around paid work, house work, child care/elder care, and community service. Dual-earner couples negotiate house work, child care, and provide support to their partners to maintain and develop their relationships. Dual-earner couples also engage in status-enhancement work to support their partner in their employment. How dual-earner couples do these things affects marital satisfaction. Dual-earner couples face many special challenges and the resources of the land-grant system support educational programs to assist families in finding a healthy balance between work and family life. Partners in the system work through a variety of multi-state efforts to decrease the potential stress associated with the dual-earner dynamic.

OUTPUTS

Nearly \$48 million dollars have been invested in research, education, extension, and integrated activities over the 5-year period from FY2000-FY2004. These efforts will be discussed below:

Research

CSREES and partner-sponsored research in human development and family well-being promoted the advancement of knowledge. Examples that enhanced KA 802 include the following:

- In a study of **Parental Relationships, Paternal Involvement, and the Well-Being of Children in Low-Income Families**, Cornell researchers gained an understanding of the characteristics associated with lower levels of parental involvement in children's lives.
- Colorado State's efforts to strengthen childcare programs explored differences in childcare quality leading to differences in child development that are measurable and lasting.
- The multi-state research project W167-**Family and Work Identities during Times of Transition** examined the association between a family's ability to keep their lives in balance and the resulting impact on levels of stress and family satisfaction.
- The multi-state longitudinal study-**Rural Families Speak** (NC223, NC1011, NRI) focused on understanding the needs of rural families impacted by changes in demographics, public policies, and community services.

Extension

Extension work in KA 802 spans infancy through late adulthood. Activities, curricula, publications, and other outreach resources supporting the quality of life of individuals and families have been developed over the FY 2000 through 2004 period. For example:

- Iowa State Extension's **Strengthening Families Program** helped parents to build positive attitudes and specific skills to nurture and guide their children from infancy through adolescence.

- University of Alabama Extension's **Healthy Couples, Healthy Children** project has helped to reduce the risk of child abuse and neglect and promote child well-being in the state of Alabama by fostering healthy couple and co-parenting relationships.
- University of Wisconsin Extension's **Alliance for Family Caregiving** provided statewide training, educational resources, and support to organizations that directly interface with family caregivers and facilitated linkages and networking opportunities with organizations directly involved in family caregiving education to enhance the knowledge and quality of life of caregivers and families throughout Wisconsin.
- Pennsylvania State University's **Better Kid Care Program** provided a variety of educational opportunities for child care workers, including direct trainings, distance education via video and web-based learning, newsletters and other publications, and full-day conferences.

Education

Higher education efforts in KA 802, supported in part through CSREES formula funds, include colleges, schools, departments, centers, and programs at 1862 and 1890 land-grant universities throughout the system. Examples of these include:

- **South Dakota State University Early Childhood Education Center** strives to be a teacher training facility that uses best practices and incorporates cutting edge research into teaching practices in the Midwest region while developing 30-50 teachers per year, generates new knowledge in teacher training through the use of inquiry-based research and study, and is an exemplary outreach program that provides high quality early childhood experiences for community children and their families.
- **Family Life Development Center at Cornell University** improves professional and public efforts to understand and act upon risk and protective factors in the lives of children, youth, families, and communities that affect family strengths, child well-being, and youth development. Areas of special interest include childhood violence prevention, evaluation of programs designed to prevent child abuse and neglect, and acquiring, preserving, and disseminating high quality data relevant to the study of child maltreatment.
- **Family Center at Kansas State University** provides applied educational training to university students while offering counseling, family-related educational programs and consultation services to the Manhattan, Kansas community and the state for over 30 years. The Family Center provides an interdisciplinary focus with faculty participation from departments within the college. Students under faculty supervision offer services involving marriage and family therapy and family life education.
- **Department of Family and Consumer Sciences at Alabama A&M University.** The main thrust of the department is the educational program for university students focusing on individual and family well-being as influenced by various environmental settings and factors. The knowledge base includes basic ideas and principles regarding individual and family structures, functions, and systems.

- **Center for Healthy Aging Research at Oregon State University** provides a permanent mechanism for bringing researchers together at OSU to plan, coordinate, and conduct collaborative, multidisciplinary studies designed to optimize the health and well-being of aging individuals and their families. The Center provides opportunities for graduate and undergraduate OSU students to learn about aging and receive training in scientific procedures related to specific disciplines. Collaborative research, seminars, colloquia, conferences, and field trips allow students to experience the science of aging in a multidisciplinary context.
- **Work and Family Life Program at the Ohio State University** provides educational opportunities for students seeking to become work and family life teachers, supporting the empowerment of individuals and families across the life span to manage the challenges of balancing life and work in a diverse, global society. The Ohio State University College of Human Ecology offers a four-year interdisciplinary bachelor's degree program designed to prepare students to become work and family life teachers.

OUTCOMES

Investment in KA 802 has resulted in significant outcomes. These outcomes are highlighted below by their short and medium-term impacts, with on-going efforts to continue momentum toward achieving critical long-term outcomes for individuals, families, and communities.

Short-Term

- Increased knowledge about healthy communication and relationships.
- Increased knowledge about social and life skills necessary to make informed choices.
- Increased knowledge about effective parenting practices to promote the growth and development of children.
- Increased knowledge about self-care, accessing community resources, and caregiving for children, elders, or people with disabilities.
- Increased knowledge and awareness among parents and child care workers of high-quality, education, and developmental experiences for children and youth.
- Increased knowledge and awareness of factors enhancing a healthy balance between work and family life.
- Increased knowledge and awareness among about supportive community services for all families, including specific audiences such as rural and military families.

Medium-Term

- Increased skills to form and sustain healthy relationships.
- Improved family functioning, communication, social, and life skills.
- Increased enrollment in education and development opportunities for individuals and families.
- Increased demand for and availability within the community of high-quality child care.

- Increased high-quality education and development opportunities.
- Increased policies and practices among employers to support work/life balance.
- Increased job satisfaction, and reduced stress, absenteeism, turnover and associated costs to workplace productivity.
- Increased use of supportive community services, reduced stress, and improved morale for individuals and families.

Long-Term

- Increasing proportion of healthy, well-functioning families.
- Increasing number and proportion of healthy marriages.
- Decreasing rates of family violence.
- Decreasing divorce rates.
- Decreasing rates of child abuse and neglect.
- Increasing school readiness for children.
- Increasing number and communities with critical mass of resources, supports, and positive parenting role models.
- Decreasing number of children in foster care.
- Improving community and state support for child care, self-care, disability, and elder care programs.
- Increasing work place productivity, reduced costs, and increased profitability.
- Increasing individual and family preparedness for stressful life events (family transitions, farm, natural, and manmade disasters, military deployments).

DISCUSSION OF SPECIFIC EXAMPLES

RURAL FAMILY LIFE

The integrated longitudinal multi-state research project: *Tracking the Well-Being and Functioning of Rural Families in the Context of Welfare Policies-Rural Families Speak* is funded through NC223, NC1011, NRI and state dollars. Sixteen states are currently involved in the research, including California, Indiana, Iowa, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Nebraska, New Hampshire, New York, Ohio, Oregon, South Dakota, and West Virginia to track the individual and family circumstances, functioning, and well-being of rural, low-income families with children, track over time the changing welfare policy environment, community factors that facilitate family support for rural low-income families with children, and analyze interactions between welfare policy, community infrastructure, and individual and family circumstances, functioning, and well-being that affect the ability of rural, low-income families with children to function in a changed environment of policies and programs.

Family scientists working on the **Rural Families Speak** project have produced over 80 policy briefs, dissertations and theses, refereed journal articles and book chapters, conference

presentations and proceedings, and other papers since the project began in 1998. A study examining the relationship between marriage, social support, and psychological well-being among impoverished, rural mothers focused on the connection between supportive relationships and mental health. The study reported the following:

Short-Term - Social support appeared to be negatively correlated with levels of depression, in addition to possibly moderating the relationship between marital status and depression.

Medium-Term - Mothers with high levels of social support were more likely to have low levels of depressive symptoms.

Long-Term - Mothers who maintained marital status over time and reported high levels of social support, reported the lowest levels of depression. Incorporating these results into outreach education efforts at the community level may enhance relationships and mental health over the long-term.

PARENT EDUCATION

The *Parenting People: Strategies for Effective Parenting Project*, funded through Smith-Lever 3(b) & (c), was developed by University of Connecticut Extension to teach parents about themselves, their children, and the dynamics that are involved with successful parenting and child rearing. During the FY2000-FY2004 timeframe the project resulted in the following:

Short-term - All participants learned about positive family attitudes related to learning, literacy, and school behavior, helping children develop positive study habits, and the importance of parent involvement. Ninety percent indicated that they felt more confident about their parenting skills after the training.

Medium-Term - Seventy-five percent of participants intended to increase their involvement in their child's school and 25 percent said that they improved their parenting skills substantially. Most parents were practicing positive communication and discipline strategies upon the completion of the classes.

Long-Term - The majority of parents reported that they would monitor their children's homework efforts more and praise them for completion, eliminate distractions at home, and offer to help at school more in the future.

CHILD CARE

Through multiple local, state, and federal funding streams, *Colorado's Child Care Resource Network* is operated by Cooperative Extension in the Tri-Rivers area of Colorado to provide leadership in building a diverse, high quality child care system and provide parents access to child care options and consumer education to recognize indicators of quality child care. During the FY2000-FY2004 timeframe the project resulted in the following:

Short-term - Cooperative Extension in Gunnison County provided in-depth workshops for childcare professionals focused on infant-toddler brain development. The 219 statewide participants received continuing education credits and increased knowledge by 20-60% about child literacy, brain development, nutrition, health, behavior, curriculum development, and best business practices. Cooperative Extension offered 12 hours of pre-licensing training for daycare providers in home and center settings in under-served counties as a joint effort with the Tri-County Family Care Center, CO Department of Health and Environment, and Child Development Services. One-hundred percent of potential child care providers learned state requirements for being a childcare provider, and increased their confidence in working with parents and providing competent childcare.

Medium-term - The resource network responded to 771 technical assistance calls from child-care providers, provided information to more than 700 individuals interested in entering the childcare business, made educational contacts with 2,948 providers, and conducted 20 site visits to childcare facilities as part of their outreach efforts.

Long-term - In Routt County, a partnership with the local **Consolidated Childcare Pilot** increased the capacity of childcare providers to deliver quality programming through monthly meetings where they receive training, discuss challenges, and work to create a collaborative service delivery system.

MARRIAGE AND COUPLE RELATIONSHIPS

The *Parental Relationship, Parental Involvement, and the Well-being of Children in Low Income Families Project* at Cornell is funded through state appropriations and seeks to examine the characteristics and meaning of relationships between mothers and fathers and between fathers and their children in low-income families, particularly those families headed by unmarried parents. The on-going study investigates how family structure and paternal involvement affect the outcomes of children in these families. During the FY2000-FY2004 timeframe the project resulted in the following:

Short-term - Negative characteristics such as drug or alcohol problems or incarceration are associated with lower levels of paternal involvement, and unmarried mothers are particularly likely to end relationships and restrict father's contact with children in cases of domestic violence.

Medium-term - When both or either parents expect to marry, they are much more likely to formalize their relationships and maintain their unions. Other factors related to marriage and union stability include having children from previous relationships, distrust, conflict, and shared activities.

Long-term - Factors that encourage and discourage union stability and paternal involvement in families headed by unmarried parents are highly relevant in shaping new welfare initiatives such as the Healthy Marriage Initiative sponsored by the Administration for Children and Families (ACF), as well as to academic research and education on marriage and non-marital childbearing.

FAMILY CAREGIVING ACROSS THE LIFESPAN

The **Family Caregiving for Dependent Elderly: Daily Understanding of Caregiving (Pilot) Study** at the University of Arizona is funded through Hatch and seeks to examine the daily experiences of primary caregivers of dependent elderly family members and to investigate fluctuations in the well-being of those caregivers. During the FY2000-FY2004 timeframe the study resulted in the following:

Short-term - Significant associations were found between caregiving benefits/gains and the following variables: agreeableness, extraversion, family support, partner/spousal support, and prior relationship quality. Partner/spousal support predicted additional variance in caregiving benefits/gains beyond agreeableness and extraversion. On days when caregivers engaged in more task assistance or experienced more family disagreements (compared to their own average), they experienced more depressive symptoms, greater feelings of burden, and more physical symptoms.

Medium-term - Findings suggest that while personality does help to account for the experience of caregiving gains, caregivers who have greater amounts of partner/spousal support are significantly more likely to gain benefits from the caregiving experience.

Long-term - Findings should be of interest to family caregivers and to professionals who work with individuals and families as they face the challenge of caregiving for the elderly.

MILITARY FAMILY LIFE

Texas Cooperative Extension Military Projects at Fort Hood and Fort Bliss, Texas are funded through Interagency Agreements between CSREES and the Department of Army to place extension agents in the offices of the Family Advocacy Program (FAP) at both Fort Bliss and Fort Hood. The extension agents provide research-based educational programs and awareness to military personnel and their families as required by Army regulation, in parenting education, couple enrichment, the training of child care providers, and the identification and prevention of abuse. Currently, 13 agents work at Fort Bliss and 60 at Fort Hood. During the FY2000-FY2004 timeframe the projects resulted in the following:

Short-term - The Army Substance Abuse Program (ASAP) used 12 agents to provide programming making soldiers and family members aware of the consequences of drug and alcohol abuse. Agents took leadership in Army-required military unit training, awareness campaigns, and violence in the workplace training for civilians. Since the extension program began at Fort Hood, awareness classes for soldiers increased from 40 percent to 100 percent of all units being reached in a year. In 2002, Texas Cooperative Extension Agents briefed 100 percent of the Units and over 85 percent of the 45,000 soldiers on Fort Hood.

Medium-term - The New Parent Support Program provides in-home visitation, therapeutic support, and resource assistance to all Army families with new babies on the installation and continuing support for families with children through the age of 5 years. The program attempts to

reduce the likelihood of child abuse and neglect and spouse abuse through individual parenting education, role modeling, and access to services.

Long-term - Extension agents provide programming in the Financial Readiness Program by training Non-Commissioned Officers to teach fiscal responsibility to soldiers in their units. Extension agents trained over 70 Command Financial Specialists who were able to reach over 80,000 individuals in 2002. Agents provide basic financial education as a part of an educational program to help new soldiers and families get started on the right foot financially and plan for the future.

BALANCING WORK AND FAMILY LIFE

The W167 **Family and Work Identities during Times of Transition Project** is funded through Hatch to determine the effects of work and family transitions on identity, the impact of identities on work and family transition outcomes, and the effects of work and family transitions on well-being. To date, the project has resulted well over 100 policy briefs, dissertations and theses, refereed journal articles and book chapters, conference presentations and proceedings, and other papers and media. During the FY2000-FY2004 timeframe the project resulted in the following:

Short-term - More than 4,000 people accessed the publication *Work and Family: Balancing and Weaving*, over 600 learned about managing family meals while dealing with busy schedules, and more than 3,500 learned about how to effectively handle stress.

Medium-term - One hundred people participated in extension programs on balancing work and family and dealing with stress through behavior change.

Long-term - Individuals from families of divorce and those who work with families of divorce have a better understanding of the work and family issues related to this family structure that assist them in negotiating work/life transitions.

SUCCESS STORIES

Just In Time Parenting Newsletters

Research shows that the early years can be difficult for parents and that they require more information and advice to help them with challenging developmental issues. Cooperative Extension's "age-paced" or "just in time parenting" (JITP) efforts meet these needs, as well as the needs of Extension staff seeking efficient and effective resources for parents. This approach is a "promising example of efforts to tailor media initiatives to the needs and preferences of harder-to-reach populations" (Simpson, 1997) shown to be effective in promoting positive parenting. The approach involves timing monthly delivery of easy-to-understand research-based parenting information so that a specific set that matches the age of a child is received "just in time."

The JITP updates help children thrive by promoting positive growth and development illustrated by developmental milestones and progressions, reinforcing positive parenting behaviors, and affirming healthy interpersonal and family relationships. Programmatically, this approach: reaches hard-to-reach families, especially those who are resistant or unable to attend parent education programs, seems to be particularly valued by and helpful to parents at risk for maltreating children, can be combined with face-to-face programs to reinforce key concepts, and provide ongoing “contact” and encouragement.

Parents who use JITP newsletters feel reassured about their child’s development and their individual and family strengths, have age-appropriate expectations for their children, and are able to identify emerging problems and learn how to find appropriate help. Parents rate the newsletters as being more useful than any other source of information (including physicians, nurses, relatives, and other printed materials), and those who report the biggest changes in behaviors and attitudes are the youngest, poorest and least educated. Parents receiving the newsletters (compared to parents who do not) report more positive parenting behaviors and provide more stimulating environments for their children. Professionals consider the newsletters valuable tools, particularly for geographically or culturally isolated parents. Multistate partners on the project developed a workgroup around these issues and were recently selected as a pioneer Community of Practice with the eXtension Initiative. Multistate partners on the project include Georgia, Ohio, Oregon, Tennessee, Michigan, New Mexico, Illinois, Kentucky, Indiana, Missouri, Nevada, Iowa, Wisconsin, and Delaware.

Wisconsin Alliance for Family Caregiving

The Wisconsin Alliance for Family Caregiving developed as a network of organizations and family caregivers that provides education, resources, and support to family caregivers statewide. Leadership of the Alliance is provided by a core leadership group and various steering committees. Each has a representative on the leadership group. AARP and University of Wisconsin-Extension provide overall leadership to the Alliance and over 75 organizations and agencies are involved in the network. There are representatives from local aging offices, educational institutions, non-profits, the Alzheimer’s network, interfaith groups, respite care facilities, senior services, and many others. Through the Alliance effort, 137 class leaders have been trained in 39 Wisconsin counties to teach the **Taking Care of You: Powerful Tools for Caregiving** curriculum. Of the 137 trained class leaders, 70 (51%) class leaders have taught classes; of these, 23% taught one class and 28% taught more than one class. Evaluations from 38 classes showed that, on average:

- Ninety-two percent of class leaders felt very confident or extremely confident in all areas of the curriculum.
- Ninety percent were well prepared or very well prepared to present and manage the class, assist participants, and respond to their questions and emotional needs.
- Class leaders have reached over 271 caregivers who report more confidence in their ability to deal with the increased care needs of the person they are caring for, their ability to do something to make themselves feel better when discouraged, and their ability to cope with the stress of caring for the person they are helping.

Military Healthy Parenting Initiative

As a result of an increasing level of military operations, many military families struggle with intermittent single parenting due to deployments, separation from extended family members which limits access to family-based parenting guidance, frequent relocation, and children's worry about their parent(s) working in dangerous situations. These issues and concerns may not be adequately addressed through civilian-based parenting curricula and support materials used in Family Centers, the Family Advocacy Program (FAP), chaplains' programs, and medical clinics. Consequently, the Air Force established the **Healthy Parenting Initiative** in partnership with the Services and Virginia Tech through USDA CSREES to develop military-specific parenting supports for the over 615,000 active duty military personnel with children. The initiative provides training and parenting resources for military personnel and their spouses, and assists commanders in identifying and addressing the needs of military families. The initiative also educates commanders about available services on and off base and the relationship between healthy family functioning and military readiness.

Extension Cares

Extension Cares is a national initiative to improve child care and youth programs for infants and toddlers, preschoolers, school-age children and youth, and teens in out-of-school time. Services include the **Kidcare** child care listserv, over 1000 reviewed publications available through the Web <http://www.nncc.org/>, and the **Connections Newsletter**- issued four times a year for family child care, center-based care, and school-age child care. The goal is to increase the quality, affordability, accessibility, availability, and sustainability of child care, school-age care, and teen out-of-school programs through federal, state, and local partnerships that tap the expertise and assets of local communities. An example of this work is the Maryland Cooperative Extension (MCE) Cares program.

Currently over 217,616 children and their families rely on licensed child care in Maryland in order for parents to work, go to school, or attend training, and statewide training clearinghouse programs have served over 14,000 child care providers. For more than a decade, Maryland Cooperative Extension has provided continuing education training for child care providers across the state. MCE offers training on topics across the Core of Knowledge (MD Department of Human Resources, Child Care Administration) to help professionals who work in child care centers and family child care homes maintain their registration and licenses.

The MCE Child Care and Afterschool Program website benefits professionals and families as a consortium of information about Maryland specific child care research and program evaluation, and professional education opportunities. This website <http://www.mcecares.org/> is a one-stop location to learn about what's happening in child care Maryland. The goal is to enhance the quality of care for children and youth by bringing together the resources of making them available to the professional community, and coordinating information about child care and afterschool program, research and funding activity in Maryland to support professionals who work with children, youth, and families.

Building Strong Families (BSF)

A statewide needs assessment showed that 93 of 114 Missouri counties wanted programs to strengthen local families. Field and state extension faculty formed the Building Strong Families program team. Fifteen team members from various disciplines came together from all regions of Missouri, University of Missouri-Kansas City and University of Missouri-Columbia, consulted their colleagues and community partners, and Building Strong Families (BSF): Challenges and Choices. BSF helps families identify their own strengths and learn skills to build on those strengths. The program uses a 13-module curriculum that can be adapted for families of different types and in different settings and situations.

The BSF curriculum includes thirteen different topics: Family Strengths, Communicating, Managing Stress, Child Self-Care, Food and Fitness, Working, Go For It!, Positive Discipline, Money Matters, Balancing Responsibilities, Consumer Beware, Healthy House, and Kids and Self-Esteem. Desired program outcomes currently focus on positive family changes. Findings show that some participants actually make personal changes first and then make positive changes in their family life. Currently, 469 facilitators from Extension and various agencies (e.g., Community Action, Head Start, schools, social services) in Missouri, Nebraska, and North Dakota have completed BSF certification training. Over 2,900 participants have been reached through this program.

Navigating Work and Family Series

The Navigating Work and Family Series is based on the work of several investigators, including John Gottman's studies on emotional development, Lawrence Steinberg's research on youth and adolescence, and the work of the many researchers who identify successful approaches to child guidance and discipline. The University of Idaho developed the series to support working families in the decisions they face about family life. The series was distributed cooperatively through Pacific Northwest Extension Publications by the three Pacific Northwest land-grant universities. Through the University of Idaho, Oregon State University, and Washington State University the publications were made accessible to over 8 million residents of the Pacific Northwest, substantially reducing costs for the participating states. The 10 handouts are used by schools, social service and counseling centers, parent information centers, early childhood centers, and in work settings and include: Caring for Yourself, Childcare: Linger and Learn, Working Together, Limits and Choices, Television and Your Family, Connecting With Kids, Family Talk, Family Reading Time, Children's Feelings, and Keeping In Touch With School.

Strengthening Families Program for Parents and Youth 10-14

This video-based intervention developed by Iowa State University and implemented in several states, is designed to reduce adolescent substance use and other problematic behaviors in youth 10 to 14 years of age. The program is delivered within parent, youth, and family sessions using narrated videos that portray typical youth and parent situations. Sessions are highly interactive and include role-playing, discussions, learning games, and family projects designed to improve parenting skills, build life skills in youth, and strengthen family bonds. The basic program is delivered over 7 weeks. Four optional booster sessions can be held 3 to 12 months after the basic

sessions. The teaching manual and videos are available in adapted Spanish called “Familias Fuertes.” SFP 10–14 has been tested with White rural families in economically disadvantaged areas and with African American families in an urban setting.

The program has been scientifically evaluated in a randomized, controlled test with families of sixth graders (at pretest) through Project Family at the Institute for Social Behavioral Research at Iowa State University. This large-scale, experimental design trial involved random assignment of 33 Iowa public schools. Outcome evaluations entailed the use of multi-informant, multimethod measurement procedures at pretest, posttest, and follow-up data collections. Of the 446 families participating in the program:

- Youth attending the program had significantly lower rates of alcohol, tobacco and marijuana use compared to control youth.
- The differences between program and control youth actually increased over time, indicating that skills learned and strong parent-child relationships continue to have greater and greater influence.
- Youth attending the program had significantly fewer conduct problems in school than youth in the control group.
- Parents showed gains in specific parenting skills including setting appropriate limits and building a positive relationship with their youth.
- Parents showed an increase in positive feelings towards their child.
- Parents showed gains on general child management including setting rules and following through with consequences.
- Parents increased skills in general child management such as effectively monitoring youth and having appropriate and consistent discipline.

NEW DIRECTIONS

Family is experienced in a wide variety of ways, but almost everyone sees it as a critical system for their development. People need only look at their lives to understand that family is important. The hopes and dreams of people are, for the most part, fairly traditional. The vast majority of people aspire to have children who are happy and healthy, to be good parents, to have lasting relationships, to care for aging parents, and, if necessary in their later years, to be cared for themselves.

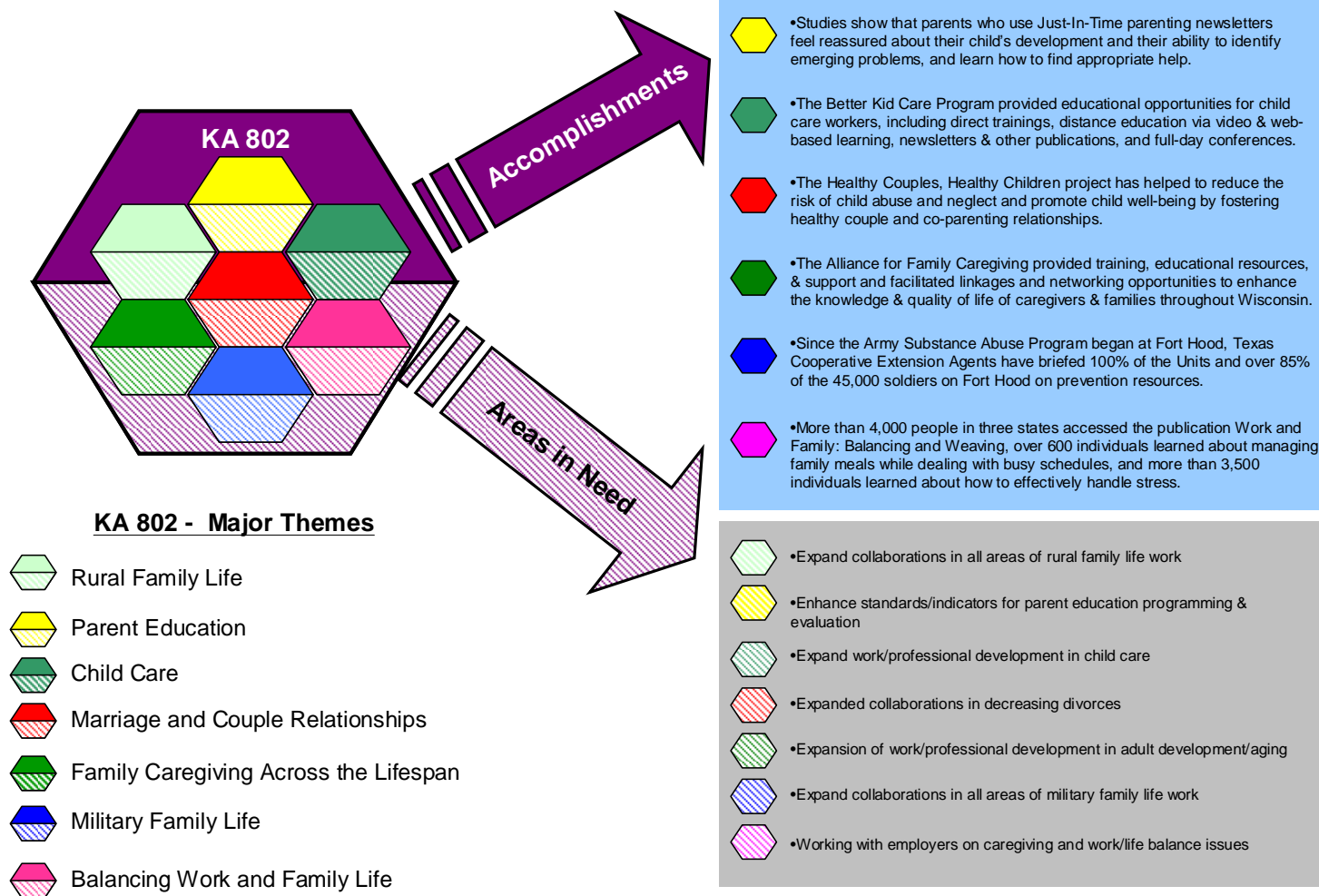
But for most people, the ideal of the traditional family is just that—an ideal. The reality is that, as life unfolds, things don't always work out as planned. People change, the unexpected happens, money and time are in short supply, and circumstances have to be addressed. Along the way, what seemed readily attainable may become highly elusive (Vanier, 2004). The work of human development and family life experts has never been more relevant than it is today.

Other issues and emerging trends that will impact this work in the future include:

- eXtension initiative-development of communities of practice around lifespan developmental issues
- E-seminars and electronic training delivery for professionals and other staff and client development needs
- Standards/indicators for parent education programming and evaluation
- Expansion of work/professional development in child care
- Expansion of work/professional development in adult development/aging
- Greater youth and family program integration
- Enhanced support of data storage and analysis around family life work, particularly in extension and higher education functions.
- Assessment of the economic impact/cost-benefit of all aspects of KA 802 work
- Working with employers on caregiving and work/life balance issues
- Expanded collaborations in all areas of family life work

Figure 17 – KA 802 Honeycomb

Knowledge Area 802: Human Development and Family Well-Being



EMERGING ISSUES HIGHLIGHT

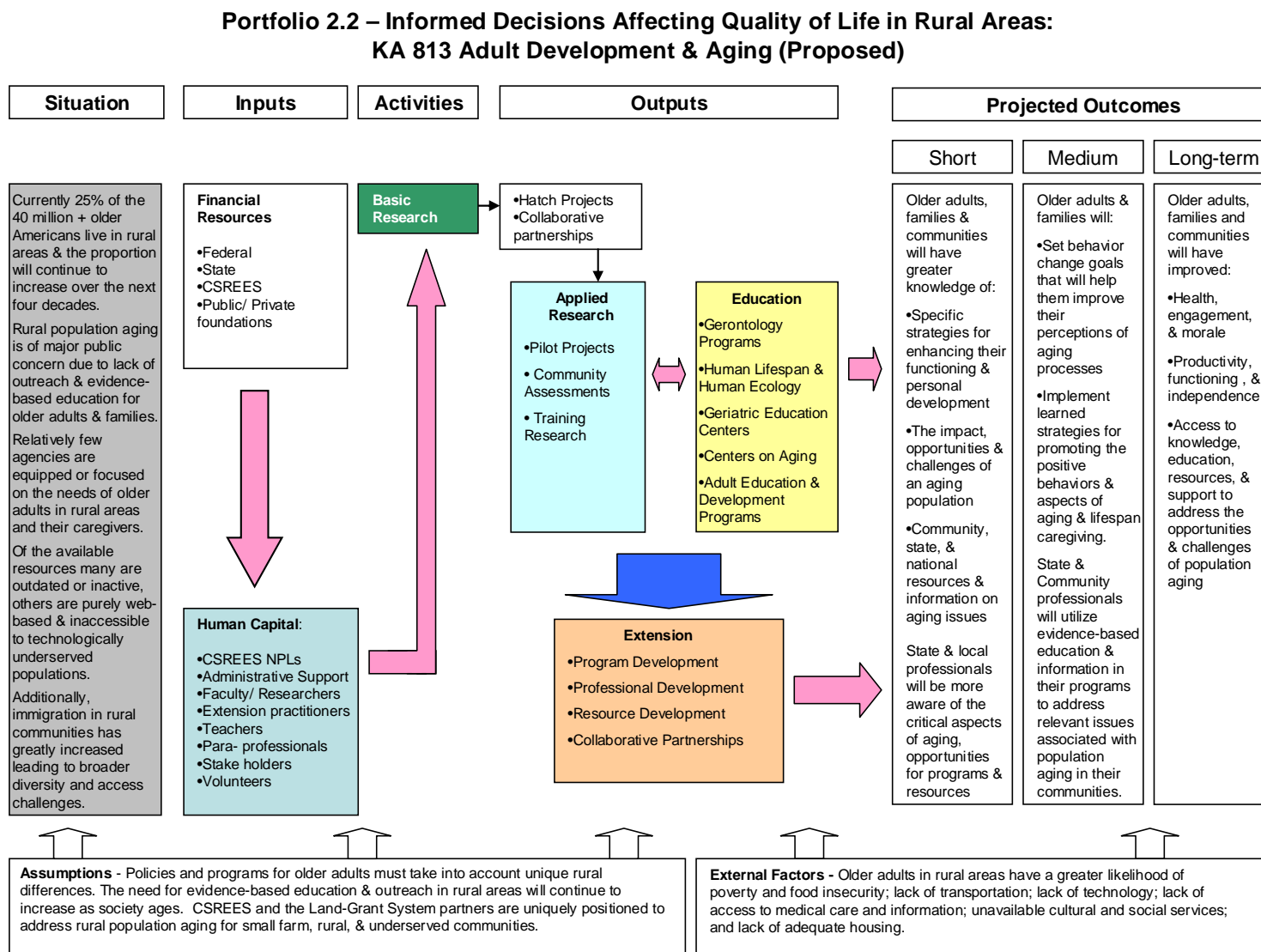
Proposed Knowledge Area 813: Adult Development and Aging

OVERVIEW

As an area of knowledge increasingly populated with data and programs conducted in the land-grant system, work in Adult Development and Aging is emerging in response to the impact of population aging on American society. This work focuses on research, education, and outreach to individuals, families, and communities, particularly in rural areas, who are preparing for or experiencing the impact of middle to late adulthood and the transitions associated with population aging in the United States. The purpose of this work is to: (1) enhance the independence, productivity, and functioning of people in middle to late adulthood; (2) provide a greater understanding of the opportunities, resources, and challenges associated with the aging of the U.S. population.

Areas of work include but are not limited to: Rural elderly and families impacted by population aging; the impact of population aging on small farm and rural communities; caregiving across the lifespan; intergenerational and civic opportunities; work and retirement; elements of successful aging (physical, emotional financial health); and collaborations on resources and education with partner agencies.

Figure 18 – Proposed KA 813 Theoretical Logic Model



SITUATION

By 2003, nearly 36 million people age 65 and over lived in the United States. This population included four million Americans age 85+. Today, well over 40 million people are 65 years of age or older and 25% of all elderly live in rural areas. By 2030, it is estimated that there will be 72 million older Americans, and the 85+ population is projected to increase to 9.6 million. By the year 2050, more than 20% of the nation's population will be considered elderly.

Many aspects of the aging population are of major public concern, have far reaching implications for the nation and will impact virtually all aspects of agriculture. Rural communities in particular, generally have a higher proportion of older persons than urban areas as a result of aging-in-place, out-migration of young adults, and in-migration of older persons from metro areas and other regions. Many rural areas dependent on farming and mining have been losing younger working-age persons and experiencing declining populations and tax bases. The remaining older population faces a wide array of challenges.

Relatively few agencies are equipped or focused on the needs associated with rural population aging or on those who provide care for older adults. Of the rural resources listed on websites of federal and non-profit agencies working on aging issues, many are outdated or inactive. Others are inaccessible to technologically underserved populations. In-migration in rural communities has greatly increased over the past two decades. This has led to diversity and access problems, creating a critical need for culturally sensitive, research-based education and information to assist communities as they face the challenges of population aging in an increasingly diverse social environment.

ASSUMPTIONS

The aging population is a concern to local, state, and federal agencies. With the burgeoning older population and the aging of the vast Baby Boom generation, policies and programs for older adults must take into account unique rural differences. Over the past decade, agencies of the United States Department of Agriculture, such as the Economic Research Service, Rural Development, Food and Nutrition Service, and CSREES have addressed population aging through a variety of services. The need for services and for education and outreach at the state, regional, and community level will continue to grow over the next four decades. In keeping with Strategic Objective 2.2, CSREES and its partners in the land-grant university system are uniquely positioned to reach out to rural elderly and their families to inform and educate them about the myriad issues, challenges, and opportunities related to Adult Development and Aging.

EXTERNAL FACTORS

Beyond the scope of research, education, and outreach that can be provided through CSREES and its partners, there are mitigating external factors impacting the quality of life of the 65+

population and their families in rural areas. Older adults have a greater likelihood of poverty and food insecurity; lack of transportation; lack of technology; lack of access to medical care and information; unavailable cultural and social services; and lack of adequate housing.

POPULATION AGING: PEOPLE AND COMMUNITIES

The system struggles to keep pace with the growing demand for educational resources, research, partnerships and support necessary to meet population aging challenges. With the size of the older population projected to double over the next 30 years, will there be sufficient human and financial resources to meet the demand? There are currently 15 extension staff specialists in the United States working on aging issues, and other system specialists and faculty (even those without a background in aging), are finding it necessary to work through a variety of collaborations to meet the aging needs of their states and communities.

From a higher education perspective, University Centers on Aging and Geriatric Education Centers are steadily increasing on land-grant campuses across the nation, and the body of research on aging issues is growing to meet increasing concerns associated with the aging population. Much of the work of the system is focusing on caregiving issues and intergenerational approaches as described below.

Lifespan Caregiving

From the earliest days, Americans have always cared for family members. There are an estimated 44.4 million caregivers age 18 and older in the U.S. (21% of the adult population) who provide unpaid care to an adult family member or a friend age 18 or older. A major national challenge, caregiving now affects one in every four households, and its prevalence is increasing. Between 1987 and 1997, the number of households in the US caring for family members or friends over the age of 50 tripled.

In addition to caring for aging parents and spouses, families are caring for children of relatives when parents are unable to provide care. Census data indicate that over 2.4 million grandparents provide care to grandchildren who are living with them. Increasing family caregiving responsibilities have collided with the smaller, employed family to intensify pressures on caregivers. The value of unpaid care is been estimated at more than \$257 billion annually (AARP). Caregiving demands often interfere with job responsibilities. One study suggests that caregivers can lose more than \$650,000 in wages, Social Security benefits, and pensions over a caregiving “career.” American businesses lose between \$11 billion and \$29 billion a year in productivity costs due to workplace disruptions, short-term and long-term absences, reduction from full- to part-time work, opting for early retirement, or leaving work entirely.

Caregivers in rural areas face additional challenges: less access to primary care; fewer resources from which to choose; lower income; less comprehensive health coverage; ill-equipped or poorly-staffed health care agencies and geographic isolation. There are many unmet needs including accurate information and support among diverse populations including minorities and

the rural poor. Families and employers in rural, urban, and suburban areas are unprepared to meet growing caregiving responsibilities, and families are the first to feel the pressure.

Intergenerational Approaches

Land-grant university faculty and specialists in aging and youth programs are promoting intergenerational approaches to maximize resources and enhance interaction between generations. This work draws upon the field of human development across the life span to bring young people and older adults together in mutually beneficial relationships by integrating knowledge from psychology, sociology, history, literature, and the arts. Specialists are developing standards of intergenerational practice to design approaches that provide children, youth, and older adults with opportunities to consistently interact in an environment conducive to supporting emotional, intellectual, and social growth and physical activity for all generations.

The trend toward a reduction in education and social services funding heightens collaboration among federal agencies, state and local counterparts, and stakeholders to strengthen the ability to respond to increasingly challenging societal needs. Interagency working groups, task forces, multi-state initiatives, and local, state, and national communities of educators and social service professionals have joined forces to share and exchange services, resources, and educational materials as a strategy for supporting comprehensive interventions to meet the demand for information and services. CSREES partners with a wide variety of organizations to maximize education, research and extension efforts on human issues, and indeed, all issues relevant to the work of Knowledge Area 802-Human Development and Family Well-Being.

Knowledge Area 803: Sociological and Technological Change Affecting Individuals, Families, and Communities

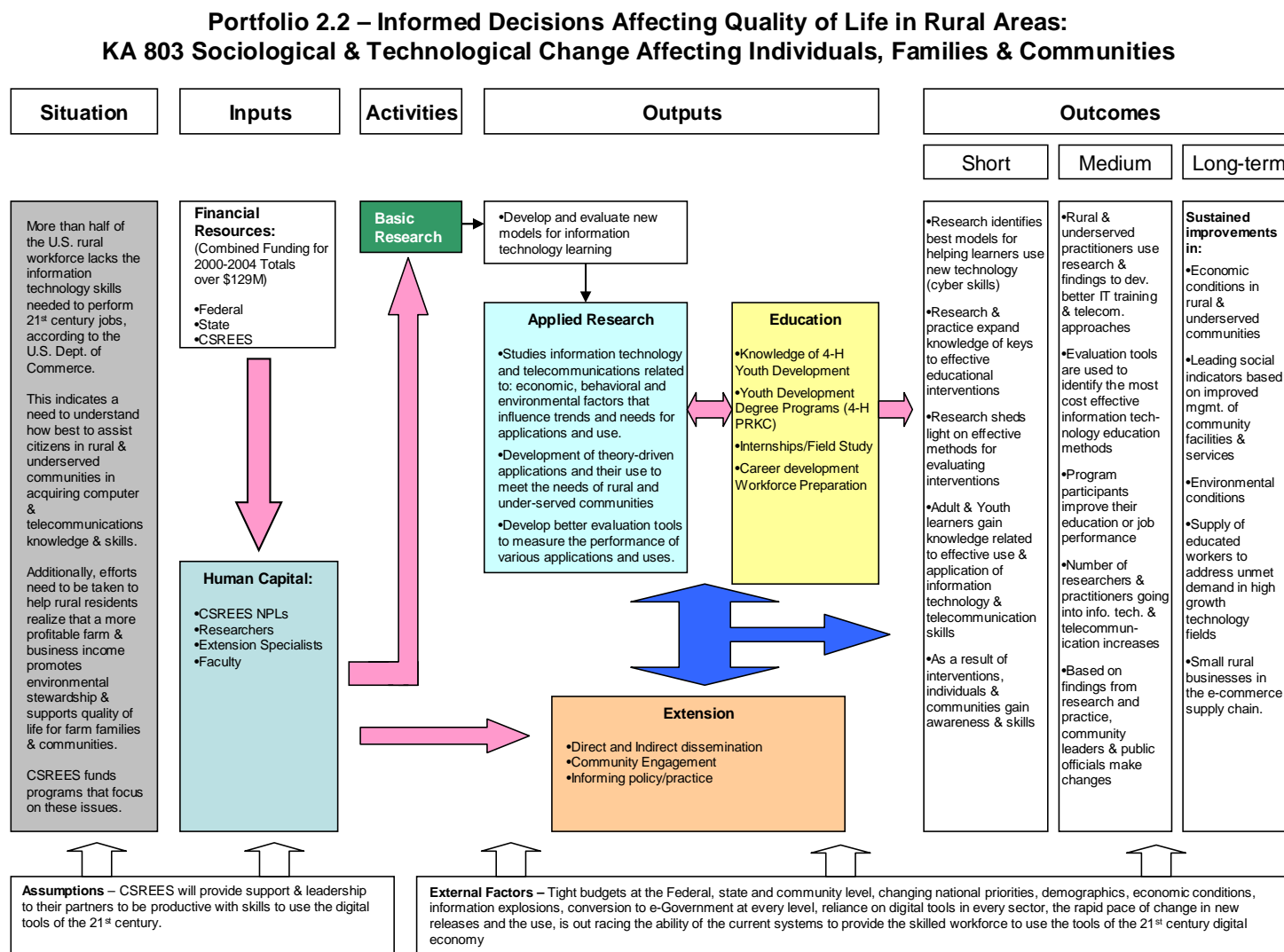
OVERVIEW

Acceleration in the migration of populations and rapid pace of technological change has challenged and altered the ways that families learn, earn and stay healthy in the 21st century. The social, economic and environmental side effects of the processing and consumption of food and fiber has altered the technological knowledge, skills and aspirations needed by individuals and families to sustain their families and communities in the 21st century.

While agriculture and manufacturing are major employers, economic restructuring has driven the rapid expansion of small business enterprises, the majority of which employ less than 10 persons. Due to the small scale of these enterprises, they often lack the depth of technological expertise to stay current with new demands of the market.

Different models of delivering education and training are needed to meet the challenges of rapid societal and technological change. New nation-wide telecommunications networks will offer access to improved information technology applications that citizens and their leaders need to learn to use to learn, earn and stay healthy in rural America.

Figure 19 – KA 803 Logic Model



SITUATION

More than half of the U.S. rural workforce lacks the information technology skills needed to perform 21st century jobs (U.S. Dept. of Commerce). There is a need to assist citizens in rural and underserved communities in acquiring computer and telecommunications knowledge and skills, referred to as “cyber skills”. Efforts need to be taken to help rural residents understand how computer and telecommunications can improve the profitability of farms and businesses, improve environmental stewardship and improve the quality of life for farm families and communities.

ASSUMPTIONS

- Lack of access to meaningful information limits the ability of citizens to make effective decisions about their lives. The 21st century requires access to timely and accurate information.
- CSREES will provide support and leadership to improve the health and well-being of Americans by helping prepare them to be productive with the cyber skills to use the digital tools of the 21st century.

EXTERNAL FACTORS

Significant external factors potentially impact the scope and results of research, education and extension efforts provided by CSREES through its partners:

- Tight budgets at the Federal, state and community level
- Changing national priorities
- Rapid migration of new citizens
- Rapid aging of national population
- Economic conditions
- Rapid increases in amount of available information
- Conversion to electronic government at every level
- Reliance on digital tools in every sector
- The rapid pace of change in new releases and the use of new software is out pacing the ability of current systems to provide the skilled workforce who use the tools of the 21st century digital economy.

INPUTS

Funding for this work relies on formula funds for research and extension, competitive research and education fees for resident education, and grants from non-profit organizations, state and

federal agencies, and foundations, and extensive collaborations between various agencies at all levels. Collaborative efforts have increased as a result of the need to maximize resources across agencies to meet critical community, health, and social service needs. Table 16 shows the relative investment of various CSREES research and education sources. The figures do not reflect CSREES' investment in extension distributed via formula funds and appropriated at the discretion of the State. The agency does not have a means for aligning this funding with Knowledge Areas at this time. Table 17 shows the level of investment in research and education to Knowledge Area 803 made by all sources for which data are available.

Table 16: Funding for KA 803, CSREES Sources

Funding Source	Fiscal Year (<i>in thousands</i>)					Grand Total
	2000	2001	2002	2003	2004	
Hatch	1,433	1,312	1,290	1,598	1,503	7,136
McIntire-Stennis	170	34	39	55	71	369
Evans Allen	224	738	762	396	430	2,550
Animal Health	1,393	0	0	0	0	1,393
Special Grants	99	597	218	244	244	1,402
NRI Grants	256	209	505	1,233	1,038	3,241
SBIR Grants	185	91	868	356	422	1,922
Other CSREES	3,760	3,254	223	987	830	9,054
Total CSREES	4,497	6,235	3,905	4,870	4,539	24,046

Table 17: Funding for KA 803, All Sources

Sources of funding	Fiscal Year (<i>in thousands</i>)					Total
	2000	2001	2002	2003	2004	
CSREES	4,497	6,235	3,905	4,870	4,539	\$24,046
Other USDA	213	231	294	443	182	\$1,363
Other Federal	973	5,739	3,497	572	855	\$11,636
State Appropriations	4,849	6,145	6,998	6,793	6,133	\$30,918
Self Generated	540	1,322	1,327	1,252	484	\$4,925
Independent/GR Agreement	10,779	330	10,695	10,500	11,047	\$43,351
Other Non-Federal	329	472	569	1,370	995	\$3,735
<i>Total KA 803</i>	24,180	22,475	29,287	27,803	26,239	\$129,984
CSREES as % of Total	18.60%	27.74%	13.33%	17.52%	17.30%	18.50%

CSREES investments in Knowledge Area 803 during the five years between 2000 and 2004 totaled \$24 million, with a yearly average of about \$5 million each year. Other Federal partner investments in Knowledge Area 803 declined from \$5.7 million to \$0.8 million between 2001 and 2004.

State investments in Knowledge Area 803 started out at the same level as CSREES funds in the 2000 budget year, however these investments increased from \$4.8 million in 2000, to \$6.1

million in 2004, a 22 percent increase. States invested \$31 million compared to CSREES's \$24 million, between 2000 and 2004.

Knowledge Area 803 programs attracted several public private partnerships that resulted in in-kind contributions of more than \$40 million, exceeding the level of investments made by CSREES and States during this period. For example, the PowerUP initiative supported by the information technology industry resulted in the placement of \$20 million in new computer labs for youth tech teams in under-served communities in 24 states between 2000-2001. Between 2003 and 2004, GIS Software Grants for 4-H supported by the geospatial industry, placed more than \$20 million in software and training into under-served communities in 44 states.

INFORMATION TECHNOLOGY EDUCATION

Information Technology Education is CSREES's program portfolio of investments made to help citizens in rural and under-served communities discover and master knowledge, skills, aspirations and attitudes to apply information technology and telecommunications for the social, economic and environmental improvement.

OUTPUTS

Research

The research portfolio of Knowledge Area 803 covered a broad range of sociological factors on the changing demographics of rural American. The research activities of Knowledge Area 803 also focus on information technology and telecommunications related to three major areas:

- Economic, behavioral and environmental factors that influence trends and needs for applications and use of information technology and telecommunications.
- Development of theory-driven applications and their use to meet the needs of rural and under-served communities.
- Models to develop better evaluation tools to measure the performance of various applications and uses.

Extension

The extension activities of Knowledge Area 803 focus on the application of knowledge generated from the research to equip citizens with the knowledge to make a difference in their lives. These areas include:

- Direct and Indirect dissemination
- Community Engagement
- Informing policy/practice

Educational

The educational activities of Knowledge Area 803 are channeled through:

- Fellowships
- Internships
- Scholarships...

to improve educational opportunities for students

Integration

Serious efforts have been undertaken to implement integrated programs through the combination of research, extension and educational activities focused on the learning about and application of information technology and telecommunications.

OUTCOMES

Short-Term

Research expanded knowledge of the many factors that influence the learning of cyber skills throughout the community. With this increased information base, training programs in various communities have become more effective in teaching the optimal use of information technology and telecommunication. Research has shed light on effective methods for evaluating training interventions. As a result of these training interventions, individuals and communities have gained awareness and skills.

Numerous models for advancing the knowledge and skills to effectively use information technology and telecommunications have been employed. One good example of successful application of new cyber skills can be found in Tennessee, where several communities launched community mapping programs with GPS/GIS technology. The model has been adopted in 44 states.

Additional examples include technology transfer programs focused on upgrading the skills of “small manufacturing” firms, that have been developed in Oklahoma,

Mississippi and Wisconsin. Model Information technology training programs focus on the needs of “small business”, resulting in small business owners increasing sales, improving profits, and expanding the workforce. Model programs for training “community decision makers” to use new information technology to improve the decisions made in community development have also been developed in Connecticut, New Hampshire and Pennsylvania.

Medium-Term

Rural and under-served practitioners use research and findings to develop better training for the application of information technology and telecommunications.

The models for updating the skills of the manufacturers’ have resulted in adoption of new management systems by small scale and rural manufacturers. In Wisconsin, 221 technical assistance projects for 113 companies, held 64 training sessions for 2,269 people, generated a reported increase of income of over \$16 million, creating/retaining 380 jobs in the region. This has positively affected small rural enterprises allowing them to expand their product limits well beyond their previous capacity. CSREES programs have increased employment through enhancements in small scale manufacturing jobs in small towns and rural areas. A number of the small business owners have transitioned into providing information technology and telecommunications services to their communities.

Model youth programs for training the use of information technology have been launched in 44 states. In 19 states, model programs promoted 5,000 technologically savvy teens to train 15,000 “seniors” so they could access health resources by using internet information. To increase community readiness through various networks, 4-H youth members have trained local community officials to use software. This led to both adult (15,000) and youth learners (5,000) gaining knowledge related to the effective use and application of information technology and telecommunication skills with improved educational and job performance.

Long-Term

Economic Indicators:

Non-farm employment increasingly requires the skills that rely upon the use of digital tools in every sector. Where workers have opportunities to develop these skills, there is a corresponding increase in the number of rural inhabitants employed in non-farm economic activities. In Washington State alone, the food processing specialist worked with 89 different businesses. Technical assistance helped create 12 new businesses and assisted in the retention/expansion of 11 businesses. Individuals gaining digital literacy skills added to the measurable increase in the number of workers earning non-farm income in rural areas. Telecommuting is reducing travel time that takes people away from their family and community, and reduces energy use related to transportation and

road maintenance. Small firms are increasingly producing products on demand, closer to the consumer, reducing delivery times and transportation costs.

Social Indicators:

Human Health is improved by access to health information, for those with access to broadband technology, where health care providers have the training to use the access tools.

Access to educational resources via distance education provides expertise to rural learners through shared learning networks. With improved skills, the effectiveness and power balance between providers and clients can be altered.

Workers gain access to skill enhancement and services needed to keep them current and active in the rural workforce.

Environmental Indicators:

Increased use of improved geographic information systems (GIS) by public decision makers have resulted in: rural water quality, rural air quality, improved zoning choices for land use, increased green space, improved transportation design, and reduced occurrence of wildfires.

Currently, CSREES supported pilot testing of GIS is going on in 200 counties in 44 states.

SUCCESS STORIES

Technology, and the adoption of innovative technologies, has always been a key component of the 4-H Program. The Geographic Information Systems (GIS) 4-H program supports national 4-H efforts to bring GIS and other geospatial technologies to young people and qualified adults involved with U.S. 4-H clubs and related organizations. Choosing sites, targeting market segments, planning distribution networks, responding to emergencies, or redrawing country boundaries—are all challenges which require knowledge of geography.

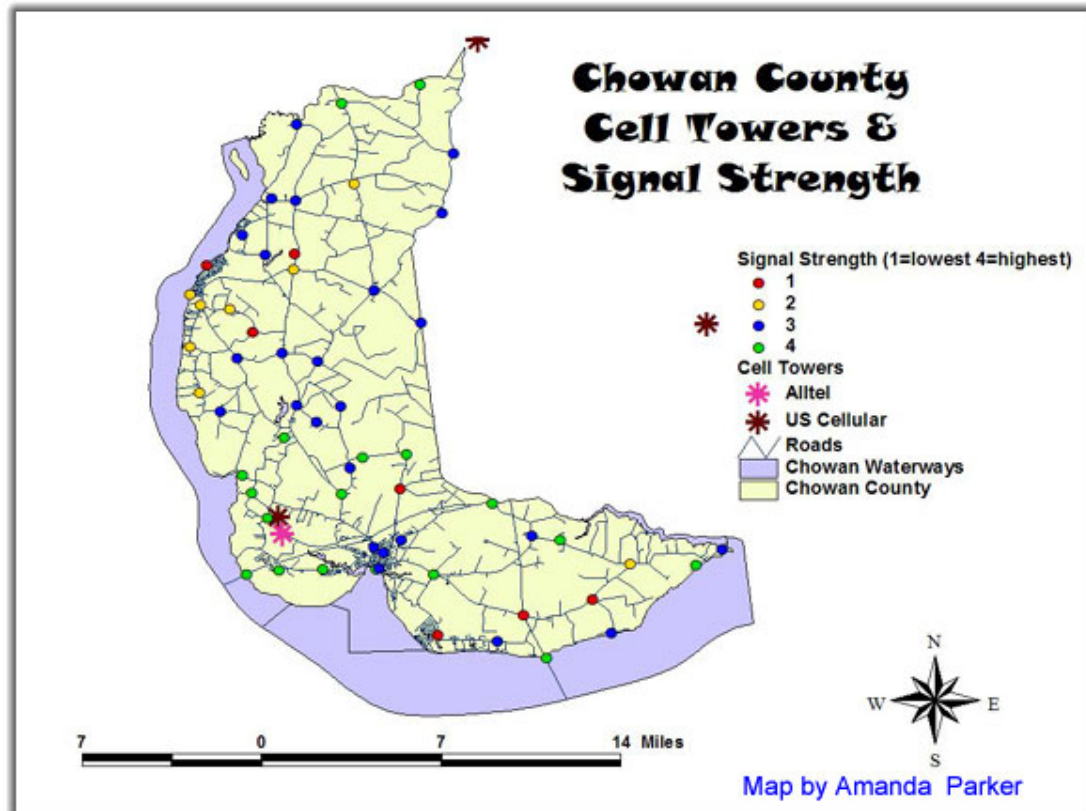
By 2004, 44 states started 4-H tech teams. The following success stories demonstrate how intergenerational change are helping advance the adoption of information technology to improve their communities in North Carolina, Tennessee, Missouri, Washington, Connecticut, Oregon, Idaho and Utah

Chowan County, NC Youth use GIS to Highlight Telecommunication Needs

The following success story was extracted directly from a report made by the Chowan County, North Carolina Community Mapping Program. See

<http://gis.esri.com/industries/k-12/commatlas/04-05/chowan4h/Chowan%20County/celltower.html>

Figure 20: Chowan County Cell Towers and Signal Strength



During hurricane Isabel in September 2003, there were articles in our local newspaper about the lack of cell phone reception in our county. Telephone service was out for several days and people tried to use their cell phones for emergencies. Many people reported they had problems during this outage because of low signal strength.

I thought it would be a good idea to identify where the strong and weak areas of reception were in Chowan County, North Carolina as my 4H project. I used our cell phone to measure signal strength and a hand held GPS unit to find our position. Our cell phone had one to four bars for indicating the strength of signal, with four bars being the strongest signal and one the weakest. My family and I rode around the county getting samples from as many areas as we could. The map above shows the data we collected.

We found good reception in and around Edenton, but poor reception in the northwest and southeastern parts of Chowan County. From our data, Chowan County needs two additional cell towers...one located in the northwest part of the county, near Smalls Cross Roads and another in the southeast part of Chowan County near Yeopim.

The example above is a “success story” with real-world implications. After seeing the above map and comments, a legislator demanded to know why cell phone service was not available through-out Chowan County – and cell phone access was expanded.

Tennessee Launches Community Mapping Program

Robertson County, TN 4-H received a 2004 ESRI (Environmental Systems Research Institute) software grant to utilize Global Positioning Systems (GPS) and Geographic Information Systems (GIS) technology for a technology and community service project in their region. Throughout 2004, Kathy Finley, the 4-H leader for Robertson County, coordinated the project in her county and worked closely with 75 4-H leaders in three adjacent counties -- Montgomery, Cheatham, and Davidson

As a result of this collaborative effort, the GIS concept, ESRI software, the GPS receiver, and geo-caching were introduced to various counties at a District 4-H Technology Camp.

2004 National 4H Technology Conference

County agents and 400 youth attended the National 4-H Technology Conference in St. Louis. The youth learned by collecting, entering data and applying GPS and GIS tools to a real community need in St. Louis. As a result, volunteer leaders from various states were introduced to the GPS/GIS concept, the technology and geo-caching. These activities have increased youth interest in geospatial technology as a new and evolving career track.

Data entered into the GIS mapping software for updating transportation flow through the attractions in Forest Park in St. Louis were used identify potential locations for capital investments by the City of St. Louis, for improvement in the facilities and the signs in the park for the 12 million visitors each year.

Community Mapping Programs Using GIS and GPS Systems in Washington

By 2004, 200 counties in 44 states have started up community mapping programs, involving more than 5,000 youth in helping apply GIS and GPS to map conditions in their communities.

For example, local, state and regional leaders may be aware of the need for better information and analysis of trends and developments to diagnose and establish a sound understanding of their communities, how they work, how they are changing, and how they can be changed, but they frequently lack the resources or staff who know how to access, organize, synthesize, analyze and interpret the pertinent data. Smaller rural areas have limited capacity to do the research needed to establish a sound baseline of information and analysis from which to build strategic plans for their future.

To help address these realities, Washington State Extension conducted 3,600 social, economic and demographic analyses on behalf of community groups, social service organizations, state agencies, local/regional economic development organizations and

private businesses. Two hundred and sixty organizations and individuals reported direct benefits for their work from these analyses. The majority of the analyses are provided through Northwest Income Indicator Project's website <http://niip.wsu.edu>.

Protecting Connecticut Water Resources

In Connecticut, water resource maps for Nonpoint Education for Municipal Officials (NEMO) have been delivered to representatives from virtually all towns, with communities revising their comprehensive plans or taking other important public policy actions to better protect water resources. National leadership has resulted in training for NEMO starting up in 35 states.

A CSREES-funded Project, Youth Tech Leadership Team, Helps High Dropout Rate School Populations Change Into "Stay in School" Populations

The National 4-H Youth Technology Leadership Team (N4-HYTLT) enhances the leadership role of youth in the use of information technology in 4-H programming. The N4-HYTLT participates in an intensive training weekend before attending the National 4-H Conference in Washington D.C. At the conference, the team does most of the technology support, takes pictures, teaches classes, and updates the conference website. In even numbered years, the team also attends and works at the National 4-H Technology Conference. During the year, the team keeps up www.4-h.org and works on various other projects that change each year. Their work supports the integration of technology into county and state 4-H programs.

4-H Tech Wizards Project Leads Latino Youth into World of Information Tech

Low Latino high school completion rates in Oregon led to the development of the 4-H Tech Wizards Project, a 36 community partner collaborative effort. This project was designed to provide at-risk youth with an opportunity to access and develop necessary computer skills, specifically basic computer literacy, using the internet, web page design, digital video documentary, Lego Robotics, geospatial technologies, and other forms of information technology. This project benefits its participants because it also offers life skills building opportunities such as: critical thinking and decision making skills, effective leadership and teamwork, project management and public speaking, which enhance employability and expand future career choices. This project has been especially rewarding for Latino youth because of the contributions of Intel Latino Network (ILN) in Washington County, Latino engineers, designers, managers, and others employed by Intel Corporation in Hillsboro, Oregon. More than 500 3rd – 12th graders participated in the program. Of those participants less than 10% left high school prematurely. Of those who remained in high school, 97% saw improvement in their GPA and 100% expressed continuing their education beyond high school. Many are now interested in computer and technology related careers. This is an improvement compared to the high school completion rate for Latino youth in Oregon was only 43 percent, as reported in Civic Report November 2001, High School Graduation Rates in the United States (Revised April 2002), The Manhattan Institute for Policy Research.

Washington State University Center to Bridge the Digital Divide

In 2003, Washington State University (WSU) made a major investment in evaluating how *Workforce preparation* and community development efforts are closely linked. The WSU Center to Bridge the Digital Divide (CBDD), with participation from a host of multidisciplinary WSU faculty and staff, moved forward with its mission to assist rural and urban underserved areas to overcome barriers to gaining the economic and social benefits of participating in the telecommunications revolution. Information communication technologies (ICT) including modern telecommunications, computers, software and digital applications represent a powerful tool to improve teaching and learning; economic opportunity, health care access and effective governance. Log on to <http://cbdd.wsu.edu> to learn about the 4-H youth tech corps and the E-safety, e-work and high-tech high school programs of the CBDD

CBDD helps people, communities and institutions apply information communication technologies to achieve these and other learning and development objectives. Specifically, CBDD facilitates collaborative partnerships; provides educational outreach, research and policy guidance resulting in the development of rural telework content for distance delivery to business and community leaders; and provides the assurance that more students leave high school ready for college, work, and civic contribution.

In 2004 the CBDD's e-work program resulted in the creation of a research-based regional strategy to encourage development of new local job opportunities through e-work. With a target of creating an additional 100 living wage jobs in seven underserved Washington locations over the next three years. The Connecting Schools and Communities initiative trained over 500 teachers and administrators in more than a dozen school districts. This training assisted in improving local school capacity for successful teaching and learning as well as the facilitation of expanded engagement among schools and community based organizations in six Washington State locations. CBDD advanced areas of youth entrepreneurship, job creation, and access to public services and other local priorities. By providing continued assistance to six Washington High Tech High Schools in their transition from traditional high school teaching models to new teaching and learning methods emphasis was placed on project based learning, meaningful internship opportunities, stronger teacher and student leadership, and engagement with web technologies

Oregon's 4-H Team Leadership Programs

In Oregon, Teen leadership programs are an essential ingredient of the 4-H youth development program. The Teen Leadership program include projects, retreats and trainings that focus on leadership in advisory boards, councils, planning committees and local commissions. The goal is to increase leadership skills, confidence and self-esteem in youth.

In 2004, 2,828 youth in 31 of Oregon's 36 counties participated in a 4-H leadership project or training program. Of these, 1,964 youth served as Junior or Teen 4-H Leaders, and 496 youth served on planning boards or local commissions.

A 2004 study measured the impact of participation in 4-H leadership programs in Oregon. Respondents were drawn from a random sample (stratified by county) of 957 4-H members, ages 12–18, from 6 representative northwest Oregon counties. Results showed that youth who participated in 4-H leadership programming showed significantly ($P<.05$) greater levels of self-esteem, proactive coping skills, and sense of contribution, and cared more about others than 4-H youth who did not participate in leadership programs. These analyses were conducted using regression techniques that accounted for differences in parental income, education and location (county).

CSREES-funded Community Readiness Network Web Sites

Communities need rapid access to local action information during an emergency, according to the Department of Homeland Security (DHS) and the Federal Emergency Management Agency (FEMA). In an effort to enhance access to Extension's Disaster Education Network's (EDEN) resources, several states are testing the development and training of local emergency responders trained by 4-H Youth Tech Teams. Through community readiness networks (CRNs), these teams are learning to provide customized access to emergency information and alerts. Local responders—fire, police, and emergency medical personnel—access the valuable content of EDEN's searchable databases. Tools like EDEN and CRN would not provide full potential to communities unless people have the information technology skills to use them. See <http://councilidaho.net/>

Youth 4-H Tech Teams collected local emergency service information, serving as cyber-journalists, updating and managing the content through the implementation of Alert Response Software in a Community Readiness Network (CRN) project to improve first responder's communication linkages in emergency situations. During non-emergency times, a CRN can be used for rapid access to social, economic, and environmental updates.

Between 2002 and 2004, a model community readiness network was pilot tested in Idaho, Oregon and Utah, and a DVD was developed for sharing the outcomes with other potential adopters. The findings demonstrated that in the pilot test communities, information technology as a tool for emergency readiness and disaster recovery was barely recognized or used. There is a tremendous unmet need for information technology awareness and development of usage skills in order to enhance access to homeland security resources. The DVD from the pilot test has been distributed for use by 14 pilot test states who have agreed to pilot the concepts further in their states.

Youth 4-H Tech Teams train the local community to use the access software, including Geographic Information Systems (GIS) and Global Positioning Systems (GPS). Since

2002, 750 Utah 4-H youth members have been trained to use Global Positioning Systems for use in search and rescue work. Those youth tech teams stand ready to assist adult and youth search and rescue teams learn to use GPS, just in time. In 2004, North Carolina Youth mapped their counties' wireless communications network capacity to perform during disasters. Georgia 4-H'ers developed maps of hurricane evacuation routes. In 2004, Arizona youth tech teams are working with local fire department on developing improved maps used by first responders.

Mississippi mobile computer labs were used as emergency mapping and command centers during Katrina recovery in 2005. Florida youth mapped the measurements of extreme rain fall resulting from the four hurricanes that hit their county.

In 2006, 14 states (Idaho, Nevada, Oregon, Maine, Indiana, Vermont, Kansas, California, North Dakota, New York, South Carolina, Arkansas, Pennsylvania and Louisiana) agreed to join the community readiness network development effort.

Citizens learn and become comfortable with accessing the dynamic local information and are able to use the same tool in times of emergency. They increase skills to effectively use communication tools. All 50 states will have EDEN (Extension Disaster Education Network) and 4-H Community Readiness Teams working together by the end of 2007.

The goals of the Community Readiness Network are:

- Increased utilization of GIS and GPS technology in emergency and non-emergency situations.
- Increased number of mobile emergency mapping and command centers.
- Increased availability of GPS assisted hurricane evacuation maps.
- Increased use of GIS and GPS in emergency planning.
- Increased use of GIS and GPS in disaster recovery, search and rescue.
- In 2005-2006, 14 states community readiness network teams will work to improve the readiness of their community for emergency.
- Increase the number of Youth tech teams that will partner with EDEN teams in their states to help grow the level of readiness and improve communications in times of disaster.

CSREES Leadership and Funding of the CyberSeniors CyberTeens Program

This unique partnership is designed to empower Seniors by providing access to and training them how to use the Internet's information and communication resources to retain their independence, dignity, purpose, through long-term mental and physical well-being. The program establishes a dynamic, intergenerational, partnership to oversee the quality of the program delivery and ensure local sustainability, extend its outreach, and promote its adoption.

The CyberSeniors Cyber Teens program increased participation in an inclusive, community-based, interactive, health literacy program that teaches seniors to use computers to obtain, interpret and understand basic health information and resources available to them on the Internet. Youth increased utilization of the Internet and taught Internet skills to senior citizens and veterans. See http://www.cyberseniors.org/artman/publish/cat_index_12.shtml

This program also led to CSREES partnering with Department of Health and Human Services (DHHS), in 1999, to co-develop an outreach program that would assist families with seniors to learn to access HHS resources for seniors being made available through the Internet. 4-H Youth and leaders from Maryland, Iowa, Washington, Connecticut, Florida and Virginia worked together as a design team known as Teens Teaching Internet Skills (TTIS). The models developed were pilot tested with Seniors and their families.

Between 2000 and 2003, CSREES sponsored a 4-H model, Teens Teaching Internet Skills and partnered with CyberSeniors to take the TTIS model to scale. The resulting program, CyberSeniorsCyberTeens, expanded to train the trainer teams in 19 states, annually resulting in 5,000 teen and adult trainers, assisting 15,000 seniors to learn to access and use health information stored on the Internet. This partnership was responsible for:

- Enhance senior citizens computer literacy for participation in the CyberHealth initiative.
- Increase ability to use computers by 15,000 senior citizens, enabling them to find and evaluate health information on the Internet.

Ultimately, Local Cooperative Extension Service programs are partnering with senior serving organizations like AARP, who are expanding and supporting the learning of CyberSkills by millions who are at or near retirement age, in order to:

- Improve access and computer training for all seniors regardless of their education, economic position and/or geographic location;
- Increase the number of seniors assuming responsibility over their health

A CSREES-funded program, the Rural E-Commerce Extension Initiative

Given that the Internet has become an indispensable medium for many activities including e-commerce, it is critical that small farms/firms become fully equipped to take advantage of the Internet. An important economic development strategy for rural places is to strengthen the economic health and stability of these small farms. One critical avenue now available to small businesses for improving their market share and efficiency of their products or services is e-commerce. While the largest share of resources is being invested in small business training, some funds are being used to identify and strengthen key educational products designed to address e-community and e-government activities by Extension educators across the nation. See <http://srdc.msstate.edu/ecommerce/>

Promising rural e-commerce Extension educational programs are currently in place in three pilot states and have resulted in:

- Catalog of current and emerging e-commerce educational products and activities for use with rural small businesses, governments, and communities.
- Increase extension educator's involvement in the delivery of sound outreach e-commerce educational programs.
- \$300,000 was invested in building an e-commerce Train the Trainer models currently in use in Mississippi, Nebraska and New Mexico.
- Three major train the trainer models prepare train the trainer teams to grow a corps of new e-commerce educators.

E-commerce educational training resources have been transformed in accordance to the E-Extension protocol, which has resulted in:

- Development of educational materials for e-commerce extension programs.
- Refined, tested, and expanded application of rural e-commerce educational programs throughout the nation.

National Rural E-Commerce Conference in 4-Corners to Help Trigger Rural Economic Recovery

Seventy-one Cooperative Extension educators and small business owners participated in the first National Rural E-Commerce Extension Conference in Farmington, New Mexico, April 12-16, 2004. The conference brought together Extension e-commerce educators from Arizona, Colorado, Minnesota, Mississippi, Nebraska, New Mexico, Ontario and Utah to serve as faculty to the 5-day train the trainer conference. Also participating were the New Mexico heads of SBA and RD-USDA as well as Qwest. The small businesses owners emphasized that e-commerce education will be key to future business expansion in rural America and that Extension agents must be knowledgeable to help local businesses survive and grow. The 4-Corner model is to be replicated in other parts of the nation, as resources will allow. Small business owners called for more support for this type of education. The web site highlighting conference events and presentations can be viewed at the New Mexico e-commerce website www.nmtabcs.org.

Evaluations of the conference attendees following the conference showed that e-commerce train the trainer models helped small rural farms/firms stay up to date resulting in:

- Increase knowledge about improved business practices.
- Expanded use of extension educators for business advice
- Expansion in number of customers beyond local markets.
- Adoption of new educational products to keep rural small businesses aware of new developments in information technology.

An example of the impacts of this initiative were recently documented by the University of Wisconsin. The Manufacturing Technology Transfer program delivers technical assistance to manufacturing companies in northwestern Wisconsin counties. The Manufacturing Technology Transfer Program developed a continuously evolving industrial extension strategy for serving the needs of the manufacturing community.

To measure the success of the project in northwestern Wisconsin counties, a client evaluation process was developed. Evaluations indicate significant forward strides in job creation, new businesses, expanded productivity, and enhanced international competitiveness. Survey results in 2004 showed that this technology transfer supported 221 technical assistance projects for 113 companies, held 64 in-house training sessions for 2,269 people, generated a reported impact of over \$16 million, and created/retained 380 jobs in the region. Clients indicated that assistance from the project helped reduce labor costs, material and inventory costs, and helped increase sales. Clients also reported that the program provides affordable, objective consultation and local access to the resources they need to help them prosper.

In Washington State, Extension provided businesses with technical assistance that helped create 12 new enterprises and assisted in the retention and/or expansion of 11 businesses. In one successful project, the Extension food processing assistance program work with the State's Manufacturing Extension Program, the Washington Manufacturing Service (WMS). In partnership with WMS, the food processing specialist worked with 89 different businesses in the Northwest to provide assistance in market analysis and development, solving quality problems, regulatory compliance, and resolving food safety issues.

CSREES' Information Technology Education Program

Internet and the Agricultural Economy (CRIS #0184245)

This study was conducted to assess the possible economic advantages of using the internet as a resource for farming related information. There were two stages of the research. The first stage involved a mail survey of 2,000 farmers from Kansas, Nebraska, Oklahoma, Missouri and Iowa. The survey asked a number of questions assessing the following: their purchases made over the Internet, estimated savings from the Internet, the benefits of acquiring agricultural information on the Internet, farm management procedures that have become more effective due to Internet use, the replacement of traditional information sources, commodities marketed over the Internet, when farm operators began using the Internet, among other questions. The second stage involved using telephone and in-person interviews with Internet marketing managers responsible for major agricultural firms' websites. Some of the topics covered in the interview were: consequences of the development of Internet services for a firm's strategies, how the Internet has contributed to a firm's competitive advantage, the estimated value of sales over the Internet, how value chain competition is being reorganized, the goods offered over the Internet, and the degree to which the website is meeting firm objectives.

Results of the study suggest that exposure to technology through college, outside employment, friends and family are more influential than farmer age and farm size. About half of the farmers interviewed who stated that they used the Internet, replied that the Internet had no economic benefits for farm-related business. Results showed that the length and purpose of use of the Internet determines the recognition of economic benefit.

Hybrid Modem for Power Line Communications (CRIS # 0192981)

In many rural areas high-speed Internet access is expensive because of the lack of competition. The Small Business Innovative Research Phase I project has developed a power line communication system that reduces cost of high-speed Internet access in rural areas, by reducing technology costs, increasing quality of service and increasing competition among existing communication services. The project utilizes a hybrid communication approach that comprised of power line modems, long-range wireless repeaters, residential gateways and local access points in order to bring broadband service to rural areas. PowerCOM is the trademark for this particular study's hybrid modem. PowerCOM's technology has been proven to support wireless back-haul IP connections that are able to cover up to 8 miles between repeaters and it supports 12 simultaneous toll-quality voice calls from each transformer on the power grid. PowerCOM's technology exceeds the level set by conventional cable and DSL services and exceeds bandwidth of current phone supports. All of these factors contribute to competition among companies to deliver cost-effective high-speed data and toll-quality telephone service to rural and suburban areas. PowerCOM is adaptable and able to keep up with future technology trends and advancements.

PowerCOM technology provides rural areas with cost effective methods for using the existing power-grid infrastructure so that advanced voice and broadband services may be better accessed and utilized. Rural and suburban consumers of telecommunication services, the stage and federal universal service funds and other government communication subsidy mechanism are beneficiaries of this technology which supports the Telecommunication Act of 1996 to reduce telecommunication subsidies and lower end-user telecommunication costs.

Impact of Technology on Rural Consumer Access to Food and Fiber Products (CRIS # 0179361)

The primary focus of this six-year Multistate Project (NC-222) was to assess resources used by consumers to acquire and access information related to food and fiber products, develop profiles of rural consumers based on product acquisition patterns and examine the process of adopting emerging communication technologies by rural consumers. Researchers from 11 states in the North Central, Western, and Southern regions were involved in this project. The Roger Diffusion-Innovation Theory was used as the theoretical framework for the project. Data for the study were collected using the following methods:

- Consumer technology-exposure experiments; and
- Large scale mail surveys of rural consumer shopping attitudes and practices.

Analysis of the experimental data collected from 358 rural and small town consumers in six states in 1999 revealed that exposure to Internet shopping sources led to positive attitude changes toward sources, exposure to television home shopping networks did not lead to a significant attitude change about shopping; and education level was not a significant predictor of attitudes.

Based on the mail survey data collected in 2000 from 2,198 rural consumers living in 11 states, respondents relied on local retail stores, newspapers and catalogs for clothing and home furnishing information. Data also indicated that consumers relied on the newspaper and retail stores for food product information. Friends, family, restaurants and television were more likely to be references for restaurant information. Less than 20% of respondents used the Internet as a source for product information and purchases, which is the least used source for information. Stores were the most frequent source of information used for all products. In 2002/2003, 847 of the respondents completed a follow-up survey. There were slight increases in Internet use for making purchases; a net gain of 79 consumers since 2000 used the Internet to buy clothing. A net gain of 100 consumers used the Internet for food purchases, and a net gain of 128 consumers used the Internet to purchase home furnishings. In general, the surveyed users used the Internet less often when compared to the U.S. average. Financial privacy concerns and credit card safety concerns increased, and overall, consumers are more likely to rely on traditional sources of purchasing and product information. Consumers under age 50 were less satisfied with local offerings than consumers over 50.

This project increased understanding of rural consumers and will facilitate development of Internet programs to familiarize consumers with product information concerning food and fiber products. Data will also aid rural retailers in adjusting to the marketplace changes and enhance economic and rural community development. Future programs developed based on these findings should include the following:

- Decrease barriers to consumer use of emerging communication technologies;
- Development extension consumer counseling programs which link technology use to survival and quality of life in rural communities;
- Develop Extension and rural community programs that strengthen rural small business development through technology transfer; and
- Help small retailers incorporate appropriate technologies into their business operations to adjust to the changing business climate of the 21st century.

NEW DIRECTIONS

The next generation of information technology and telecommunications will focus on the mastery of geospatial technologies including, global positioning systems, geographic information systems and remote sensing.

Future programs developed based on these findings should include the following:

- Decreased barriers to consumer use of emerging communication technologies;
- Development of extension consumer counseling programs which link technologies used to survival and quality of life in rural communities
- Development of extension and rural community programs that strengthen rural small business development through technology transfer.

In 2006, CSREES will provide leadership and support to the National Extension Technology Conference (NETC), hosted by the University of Florida in Gainesville, May 8-11, 2006. The vision for this conference is to provide Extension educators an opportunity to share their research and developments in the use of information technology and telecommunications to deliver education and information to the citizens they serve in rural America.

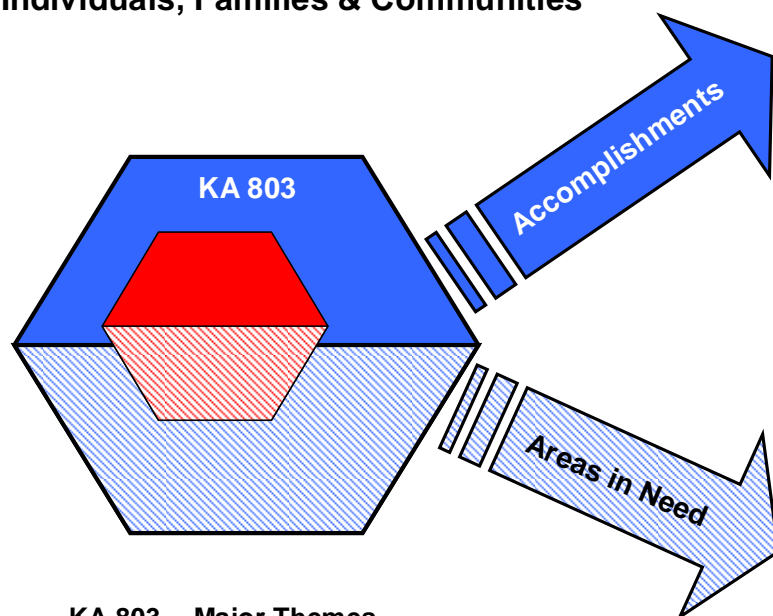
In 2006, CSREES will provide national leadership to the 2006 National 4-H Technology Leadership Conference. The theme of the conference is Science, Engineering, and Technology for the 21st Century. The conference will occur July 24-28, 2006, hosted by the University of Nebraska on their campus in Lincoln <http://4hntc.org>

Other issues and emerging trends that will impact this work in the future include:

- eXtension initiative development of communities of practice around emergency management and community mapping.
- Increases in demands for ebusiness assistance as agricultural producers transition into small business start ups throughout rural America.
- Increase in demand for geospatial learning will increase the need for geospatial faculty and geospatial extension specialists.
- Increases in demand for improvements in emergency management communication will increase need for emergency management faculty and specialists.

Figure 21 – KA 803 Honeycomb

Knowledge Area 803: Sociological & Technological Change Affecting Individuals, Families & Communities



KA 803 - Major Themes

 Information Technology Education



- Expanded knowledge of factors that influence cyber skills throughout the community
- Improved effectiveness of evaluation methods for interventions
- Launched mapping programs with GPS/GIS technology
- Adoption of new management systems by small scale and rural manufacturers



- Mastery of geospatial technologies, including geospatial positioning systems, geographic information systems and remote sensing
- Precision agriculture skills to improve the effectiveness and efficiency of agricultural inputs, based on guidance systems beamed from global positioning satellites

Knowledge Area 804: Human Environmental Issues Concerning Apparel, Textiles and Residential and Commercial Structures

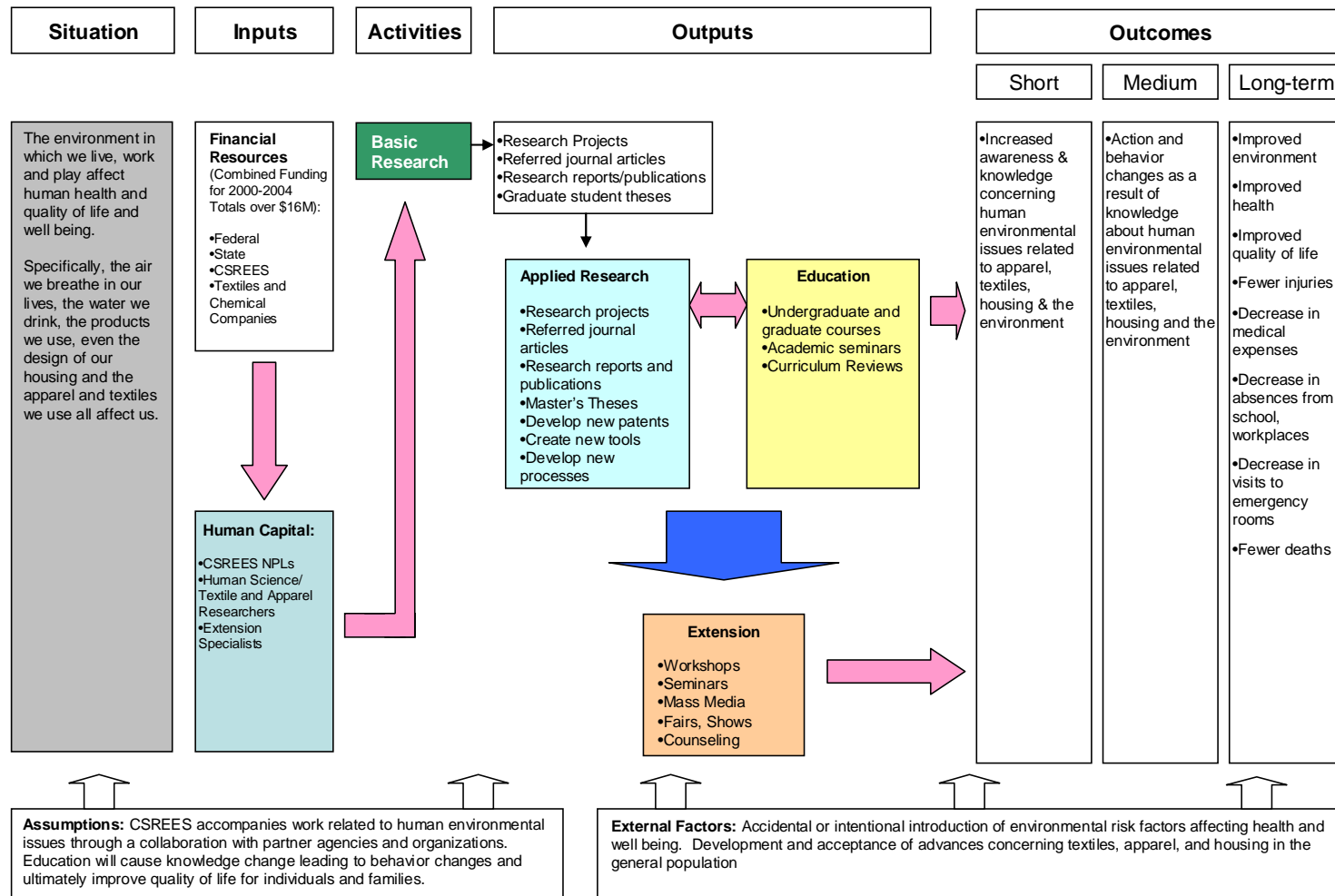
OVERVIEW

Work in the area of Human Environmental Issues follows Congressional mandates as set forth in the Clean Air Act (1970), the Safe Drinking Water Act (1974), the Clean Water Act (1977), the Pollution Prevention Act (1990), the Residential Lead-Based Paint Hazard Reduction Act of 1992 and regulations issued by federal agencies. Research, education and extension work in human environmental issues concerning apparel, textiles and residential and commercial structures provides an understanding of the social, economic and design aspects of housing and the social, aesthetic and functional aspects of apparel and textiles. Work in this area provides a better understanding of the interface among producers, retailers and consumers. This work relates directly to the CSREES and USDA missions –to support the improvement of quality of life, particularly in rural America and funds are allocated to three distinct area: Apparel and Textiles, Housing Environmental and Health/Safety, and Housing Affordability.

- **Apparel and Textiles:** primarily focuses on research on environmental issues related to textiles as related to health and safety.
- **Housing Environmental and Health/Safety/Issues:** focuses on issues (including air and water quality, home safety, and energy issues) that contribute to sustainable housing environments. Work includes research, extension, and education.
- **Housing Affordability:** focuses on home buyer and tenant/landlord issues including pre-purchase needs, mortgage delinquency counseling, home maintenance, and post-occupancy education. Research, extension, and education efforts are included. Work focuses on first-time home buyers, renters, and the elderly.

Figure 22 – KA 804 Logic Model

**Portfolio 2.2 – Informed Decisions Affecting Quality of Life in Rural Areas:
KA 804 Human Environmental Issues Concerning Apparel, Textiles and Residential and Commercial Structures**



This area addresses the basic human need of protection from the natural and man-made environment. USDA supports basic and applied research, education, and extension efforts to improve the protection offered by textiles, by apparel, and by housing. USDA supports producers and manufacturers, and consumers by supporting expansion of the range of fiber crops, finishes, fabrics, and home production materials and techniques used make production of textiles, apparel and housing. If production is more efficient or more innovative, productivity, market share, and farm incomes may be increased, while better serving consumers. USDA seeks to expand the options available to home buyers and renters by supporting research to make housing more affordable. USDA supports efforts to minimize harm to the health of workers and consumers by reducing exposure to hazards both natural (ultraviolet radiation) and man-made (chemicals, pesticides, cigarette smoke, etc.).

SITUATION

The environments in which we live, work and play and the apparel we wear affect our human health, our well-being and our quality of life. Specifically, the air we breathe in our homes, the water we drink, the products we use for our apparel and in our homes, even the design of our housing and the apparel and textiles we use all affect us. This Knowledge Area includes basic and applied research, education, and extension to solve problems in three distinct areas: Apparel and Textiles, Indoor Environmental and Health/Safety, and Housing Affordability.

ASSUMPTIONS

- CSREES accomplishes work related to human environmental issues through collaboration with partner organization and agencies.
- CSREES personnel have networks and support to conduct research, extension and education programs.
- Education will cause knowledge change leading to behavior change and ultimately to improved quality of life for individuals and families. Clothing and personal protective devices can help protect the health and well-being of workers exposed to chemicals such as pesticides and herbicides and could increase associated health risks.

EXTERNAL FACTORS

Several factors affect the performance, outcomes and CSREES program attributions that are achieved in this knowledge area.

- National and foreign policy and political and social changes, including domestic and international economic factors
- Institutional commitment, coordination and cooperation of partners from Federal, State and Industry with CSREES.
- Level of funding available for partnering efforts at the federal, state and local level

- Development and acceptance of advance in human environmental issues concerning housing and textiles and apparel by the general population and the various stakeholders and professional community
- Accidental or intentional introduction of environmental risk factors that can affect human health and well being
- Federal and state regulatory programs including compliance

INPUTS

This program focus aligns with the CSREES Strategic Goal 2- to Support Increased Economic Opportunities and Improved Quality of Life in Rural America. Funding for this work relies on formula funds for research and extension, fees for resident education, and grants from non-profit organizations, state and federal agencies, and foundations, and extensive collaborations between various agencies at all levels. Collaborative efforts have increased as a result of the need to maximize resources across agencies to meet critical community, health, and social service needs.

Table 18 - CSREES Sources of Funding for KA 804

Funding Source	Fiscal Year (<i>in thousands</i>)					Grand Total
	2000	2001	2002	2003	2004	
Hatch	\$248	\$359	\$217	\$243	\$223	\$1,290
McIntire-Stennis	\$75	\$66	\$74	\$82	\$77	\$374
Evans Allen	\$0	\$0	\$107	\$118	\$107	\$332
Animal Health	\$0	\$0	\$0	\$0	\$0	\$0
Special Grants	\$0	\$0	\$0	\$0	\$96	\$96
NRI Grants	\$118	\$526	\$232	\$61	\$73	\$1,010
SBIR Grants	\$195	\$341	\$296	\$0	\$0	\$832
Other CSREES	\$0	\$141	\$0	\$107	\$96	\$344
Total CSREES	\$636	\$1,433	\$927	\$610	\$671	\$4,277

Table 19 - CSREES, Federal, State and Other Sources of Funding for KA 804

Sources of funding	Fiscal Year (<i>in thousands</i>)					Grand Total
	2000	2001	2002	2003	2004	
CSREES	\$636	\$1,433	\$927	\$610	\$671	\$4,277
Other USDA	\$224	\$170	\$211	\$96	\$88	\$789
Other Federal	\$154	\$224	\$370	\$329	\$420	\$1,497
State Appropriations	\$1,441	\$1,393	\$1,679	\$1,173	\$1,092	\$6,778
Self Generated	\$122	\$99.	\$147	\$88	\$93	\$549
Independent/GR Agreement	\$427	\$256	\$177	\$130	\$325	\$1,315
Other Non-Federal	\$103	\$185	\$389	\$220	\$220	\$1,117
<i>Total KA 804</i>	\$3,106	\$3,760	\$3,900	\$2,646	\$2,910	\$16,322
CSREES as % of Total	20.48	38.11	23.77	23.05	23.06	26.20

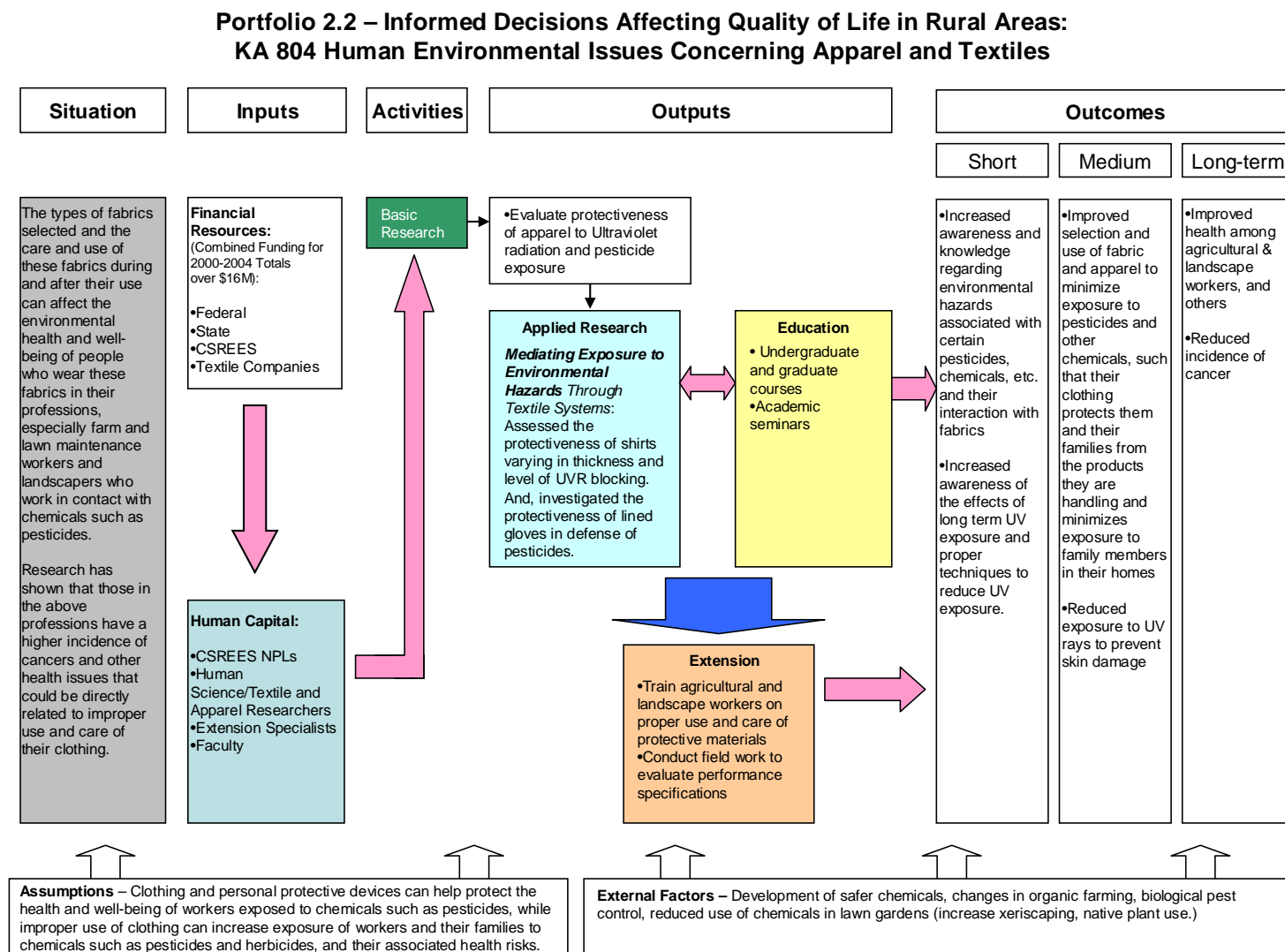
As shown in Tables 18 and 19, CSREES invested a total of \$4.277 million from 2000 through 2004 for KA 804 and other sources including Federal and State totaled \$16.322 million. Overall, CSREES contributed 26.20 percent of the total amount invested over the 5 year-span. A closer look at Table 18 shows that most CSREES funds come from NRI and SBIR grants with an increase in 2001 and 2002 over the other three years.

Funding streams from both CSREES and other sources of funding have remained fairly constant for the past five years with the major exception of recent decreases in state appropriations and increases in other federal and non- federal sources of funds. As state appropriations decreased, there has been an increased emphasis on securing funds both at the federal level and non-federal levels to compensate so that the programs in KA 804 could continue to function and generate meaningful results toward solving problems addressed in the strategic plan of USDA, and the REE and CSREES missions.

APPAREL AND TEXTILES

Apparel and Textiles primarily focuses on research on environmental issues related to apparel and textiles as related to health and safety.

Figure 23 – KA 804 Logic Model – Apparel and Textiles



SITUATION

A variety of human health problems have been attributed to occupational exposure to hazardous environments, including toxic chemicals, especially pesticides; as well as heat/fire; and the damaging ultra violet rays from the sun.

Consumers need protection from sunlight. Of the three types of ultraviolet rays given off by the sun, ultraviolet rays A and B (UVA, UVB) contribute to skin cancer. VC rays are blocked by the ozone layer from penetrating the earth's atmosphere. Workers, especially emergency workers, medical, agricultural and landscape workers need protection from hazards such as fire, chemicals, pesticides – and biohazards. Projects on personal protective equipment are needed to mitigate the effects of environmental hazards address the issues that impact human health and safety.

Research on new fibers, methods of production, fabric finishes and on manufacturing techniques not only helps businesses to remain competitive and helps to sustain the apparel and textile industries, but also is used in further developmental research to increase the acceptability, comfort, and protective functions of clothing.

Research addressing how clothing fits different body types can be used by manufacturers to create “custom” clothing for consumers, but is also applied to enhance the protective function of clothing for consumers and workers.

ASSUMPTIONS

Emergency workers, medical personal, agricultural and landscape workers have a higher incidence of injury and disease and other health issues that could be directly related to inadequate protective clothing, lack of use, or improper care.

Fit and comfort may influence whether workers actually wear protective clothing. The types of fabrics selected and the care and use of these fabrics during and after their use can affect the environmental health and well-being of people who wear these fabrics in their professions, especially farm and lawn maintenance workers and landscapers who work in contact with chemical pesticides.

Clothing and personal protective devices help protect the health and well-being of workers exposed to chemicals such as pesticides and herbicides and could increase associated health risks.

EXTERNAL FACTORS

External factors that could help or hinder research, education, and extension efforts in this and related areas include genetic research on plants, identification of new fiber plants for use in textiles, identification of new synthetic fibers, development of substitutes for petroleum-based products, development of new processes and/or safer chemicals for fabric finishes, as well as changes affecting consumers and workers acceptance and use of protective clothing. Workers' use of protective clothing may be affected as well by changes in agriculture and industry. For example, in agriculture and landscaping, changes in practices such as organic farming, biological pest control, and reduced use of chemicals in lawn gardens (increased xeriscaping, native plant use) are external factors. Increased threat of use of biohazards is yet another external factor that could affect the demand for and supply of protective apparel and textile products.

OUTPUTS

Since 1982 when the NC-170 Regional Research Project was organized, a group of land-grant universities has collaborated in a research and extension network. From 1997 to 2002, the project was titled "Occupational Safety and Health Through the Use of Protective Clothing" and included California, Iowa, Illinois, Maryland, Minnesota, New York, and Oklahoma. Protective clothing issues studied included minimizing pesticide exposure, ultraviolet exposure from the sun, and effects of heat stress, flames and radiant heat encountered in wild-land fire fighting.

From 2003 to 2008, the five-year project addresses "Mediating Exposure to Environmental Hazards through Textile Systems" (supported by allotments of the Regional Research Fund, Hatch Act and Evans-Allen funds). Researchers from California, Colorado, Iowa, Illinois, Maryland, New York and Oklahoma are participating. Goals are:

1. To improve protection and human factor performance of personal protective equipment through product development;
2. To examine acceptance of personal protective equipment and practices, and barriers to their use; and
3. To develop performance specifications for protective clothing materials.

In addition to refereed journal publications by project researchers, over the course of this initiative, the group sponsored three international symposia to inform other researchers and the public about research progress, and published proceedings of the symposia. Pre-conference sessions disseminated findings to extension faculty to address their specific information needs. The group also created a website, <http://txnc170.j8man.cornell.edu/about.html>.

NEW TECHNOLOGIES FOR THE UTILIZATION OF TEXTILE MATERIALS, Southern University, research added new knowledge in the processing of kenaf fiber – a new fiber that to be combined with cotton. The University’s first textile technology research laboratory has grown into a state-of-the-art textile technology laboratory equipped with high-tech equipment and instruments.

Maryland developed an online system, “Work and Protective Clothing for Agricultural Workers” to provide access by researchers and developers of protective clothing to technical data pertaining to clothing worn by workers. A predictive model is being added to estimate penetration of pesticides through fabrics.

Oklahoma analyzed data from four focus groups addressing the needs of first responders to disasters for personal cooling systems worn with chemical protective clothing. Results were used in refining designs for protective vests, described below.

MEDIATING EXPOSURE TO ENVIRONMENTAL HAZARDS THROUGH TEXTILE SYSTEMS, Cornell University, is doing methodological work on use of the 3D body scanner for apparel research including visual analysis, image databases, and analysis of active positions. Data were collected for cooling vests designed for use with chemical protective clothing to prevent heat stress injuries. A study of the fit and performance of protective coveralls for agricultural workers is underway, and is being used in the design of a disposable protective coverall.

OUTCOMES

Short-Term

Short-term outcomes include increased awareness and knowledge among workers and consumers regarding environmental hazards associated with certain pesticides, chemicals, etc. and their interaction with fabric. They also include increased awareness and knowledge among researchers, educators and extension staff of the need for better protective clothing, factors affecting acceptance and use, and development of products intended to address unmet needs.

Iowa collected survey data on sun safety attitudes and consumer preferences for sun-safe shirt features at a Farm Progress Show sun-safety exhibit. Visitor responses suggested the need for further education in order to persuade consumers to modify their behavior and limit their exposure to the sun’s ultraviolet rays.

Cornell developed a statistical model of pesticide penetration through woven work clothing fabrics, using simple fabric and liquid parameters considering 18 woven fabrics against pesticide mixtures of atrazine and pendimethalin. The combination of fabric thickness, cover factor, yarn twist factor and yarn packing factor is used to estimate air permeability of woven fabric, an indicator of comfort (and thus acceptability).

Oklahoma completed a large three-year collaborative effort to develop a personal portable cooling system. Intended for use by first responders wearing chemical protective gear to hazardous materials sites, this battery-powered, portable, personal cooling system was completed for final testing.

Cornell developed protocols for the use of a 3D body scanner as a tool for data collection and analysis of the performance of protective clothing. This protocol is used to develop effective products for protection.

Medium-Term

Medium-term outcomes include behavioral changes, such as increased selection and use of textiles for clothing by consumers, farm workers and landscapers exposed to environmental hazards such that their clothing protects them from the products they are handling. Mid-term outcome includes additional steps to the production or further development of new products.

Cornell conducted a survey of pesticide handlers understanding of how personal protective equipment (PPE) requirements change with engineering devices for application conducted for growers of vegetables and field crops. More than 90 percent of those surveyed use some type of engineering controls; the most common are enclosed tractor or truck cab, low-drift nozzles, mounted hand-wash water supply, and the container rinse system. Despite broad understanding of both PPE and engineering controls, fewer than 12 percent of respondents adjusted their PPE choices to match their use of engineering controls. As a result of this project, they learned better practices.

Long-Term

Long-term results from research funded in 1999-2004 are not yet available, but are expected to improve health among farm workers, landscapers, and consumers and to lead to a reduced incidence of cancers among workers and consumers.

SUCCESS STORIES

In a project, Natural Fibers and Biobased Polymers: New Structure and Functions, University of California, Davis researchers investigating transgenic cotton tested how fiber strength depends on cell development as well as cultivars. Research has shown promise of nanoporous structure inside fibers, a basis for nano- and biobased materials science from agricultural components and materials, with long-term implications for high value-added applications of agricultural components and materials.

Manufacturers of sun-protective clothing face a confusing array of information. The published literature contains many contradictory claims about the parameters influencing ultraviolet radiation (UVR) transmission through fabrics. The study **DEVELOPMENT OF TEXTILE MATERIALS FOR ENVIRONMENTAL COMPATIBILITY AND**

HUMAN HEALTH AND SAFETY, University of Nebraska, shed more light on the influence of fiber type, fabric porosity, thickness, and thread count on the UVR-blocking properties of undyed summer-weight fabrics. University of Nebraska completed a study designed to more systematically examine the influence of fiber type, thickness, thread count, and porosity (measured by cloth cover calculations and percent cover estimated via image analysis) on UVR transmission. This research contributed to the development of computer software for measuring and calculating Ultraviolet Protection Factor (UPF) in fabrics. Research findings have proven useful to manufacturers of sun-protective clothing who supply clothing to skin cancer survivors and patients undergoing radiation and chemotherapy. This research also helped shape American Society of Testing and Materials standard practices for preparation and measurement of UVR transmission in fabrics.

The project **MEDIATING EXPOSURE TO ENVIRONMENTAL HAZARDS THROUGH TEXTILE SYSTEMS**, University of California, Davis, incorporated bioprotective functions on firefighters' uniforms to develop new materials, new finishes, and prototype garments. In the continuation of the study on protective clothing for first responders, a novel technology that can prepare self-decontaminating fire fighters' uniforms has been developed. Nomex fabrics, widely employed in firefighters' uniforms, can be directly chlorinated in a simple wet treatment, and the finished fabrics exhibited rapid and rechargeable antibacterial functions while retaining existing mechanical and fire resistant properties. Researchers established a new theory of chemical wet finishing of textiles addressing the biocidal functions of the textile materials. The new technology can dramatically improve biological and potentially chemical protection on first responders. UC Davis is applying theory to fabrics for protective clothing and military textiles to significantly improve protective functions of the currently used materials and provide better protection for first responders. This research has resulted in collaboration with National Personal Protective Technology Laboratory (NPPTL) of the National Institute of Occupational Safety and Health (NIOSH). One of the antibacterial technologies resulted from the Nomex research is being tested by the US Air force for antimicrobial underwear and uniforms. Another technology is applied in production of biocidal hospital linen products.

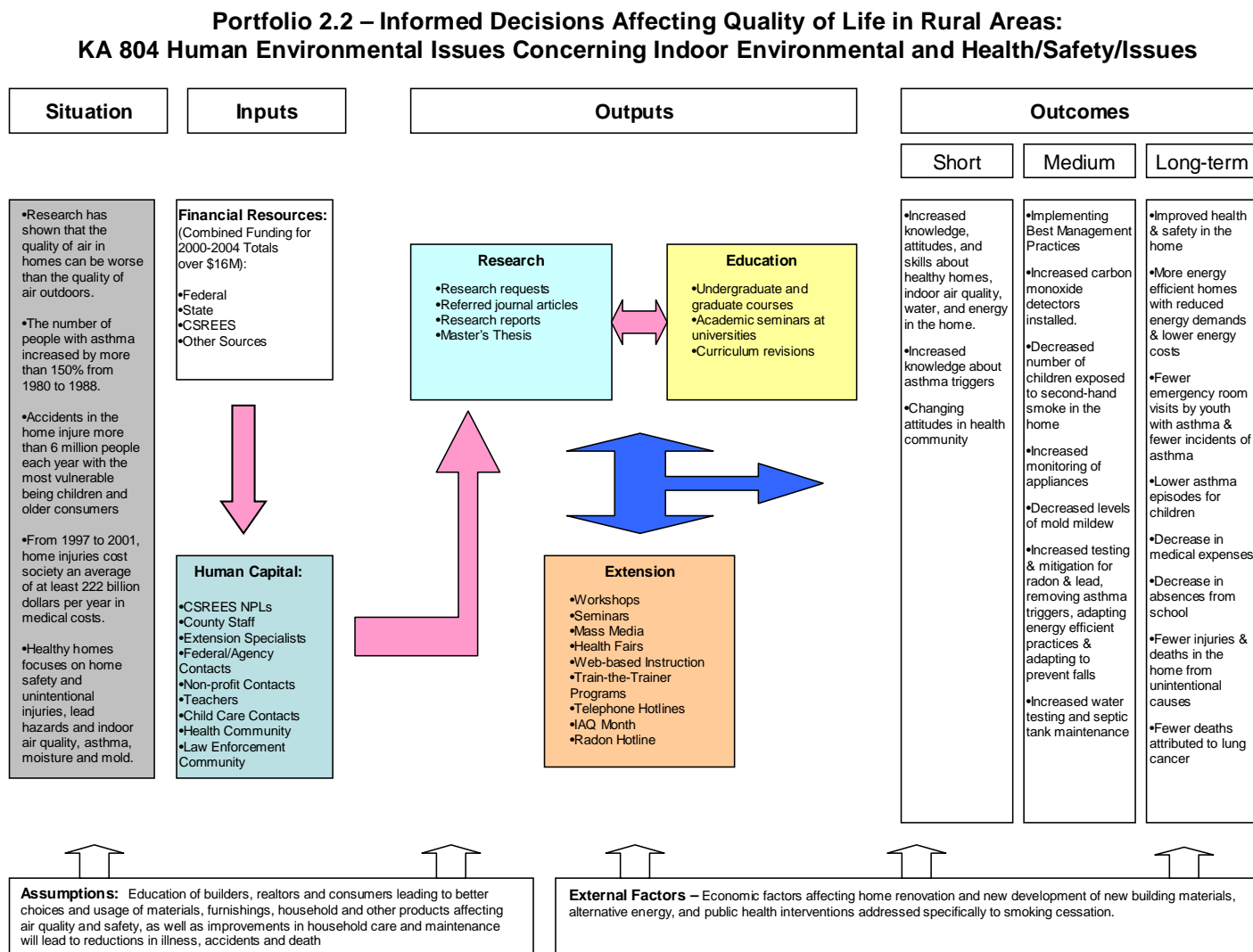
UC Davis, learned to safely attach chlorine-containing and bacteria-fighting molecules called halamines to textile fibers, applicable to products including sports socks, hospital scrubs and incontinence pads. The UC Office of the President's technology transfer program arranged a licensing agreement with Seattle research and development company HaloSource. UC Davis applied for a patent for a cloth dyeing technique that uses nanotechnology, or particles of the smallest size. Currently, multiple cycles are needed to color a fabric blend, as different dye solutions are needed for different fibers. These multiple-cycle processes produce a significant amount of wastewater for the manufacturer. It was found that by using a carbon black pigment made of nanoparticles the color would transfer into the fabric in one step.

http://www.dateline.ucdavis.edu/113001/DL_patentside.html

INDOOR ENVIRONMENTAL AND HEALTH/SAFETY/ISSUES

Indoor Environmental and Health/Safety/Issues: focuses on a broad range of issues (including air and water quality, home safety, and energy issues) that contribute to sustainable housing environments. Work includes research, outreach, and education.

Figure 24 – KA 804 Logic Model – Indoor Environmental and Health/Safety/Issues



SITUATION

Research has shown that the quality of air in homes can be worse than the quality of air outdoors. Construction materials, furnishings, combustion appliances, household and hobby products can compromise indoor air quality. Health Indoor Air for America's Homes focuses on moisture and mold, radon, asbestos, lead, tobacco smoke, carbon monoxide, formaldehyde, household products and furnishings, and asthma.

Asthma has been increasing significantly in the early 1980's the number of people with asthma increased by more than 150% from 1980 to 1998. Asthma affects 17 million children for whom it is the most common chronic childhood disease. Tobacco smoker causes 430,000 deaths per year. Radon gas causes 15,000 to 20,000 deaths per year. According to the U. S. Environmental Protection Agency, the average house causes twice as much pollution as the average car.

Accidents in the home injure more than 6 million people each year with the most vulnerable being children and older consumers. Each year, 2.5 million children are killed or injured by dangers in the home.

From 1997 to 2001, home injuries cost society an average of at least \$222 billion per year in medical costs. Falls and poisoning were the number one and two causes of injuries.

Healthy Homes focuses on home safety and unintentional injuries, lead hazards and indoor air quality, asthma and moisture and mold.

A major challenge will be the sustainable use and conservation of natural resources, especially energy. Improving the energy efficiency of homes as well as alternative sources will be necessary to reduce energy costs. The Energy Program focuses on building new energy efficient housing and upgrading existing housing with efficient products and technologies. Housing needs to be affordable, sustainable and meet the health and safety needs of all age groups.

ASSUMPTIONS

Education of builders, realtors, and consumers leading to better choices and usage of materials, furnishings, household and other products affecting air quality and safety, as well as improvements in household care and maintenance will lead to increases in energy conservation and reductions in illness, accidents, and death.

EXTERNAL FACTORS

Economic factors affecting home renovation and new construction, development of new building materials, alternative energy, and public health interventions addressed specifically to smoking cessation.

OUTPUTS

- Comprehensive train the trainer program - Based on an annual survey of 47 participating states, DC and three territories are the following outcomes:
 - 4,962 train the trainer sessions were held that reached 161,120 individuals (extension educators, health department officials, teachers, realtors, builders)
 - 4,237,456 consumers reached
- Developed Training Manual with 13 self-guided lessons
- Youth and adult materials
- Bilingual materials
- Website and list serve for programs
- IAQ Month and materials
- Radon action Month and materials
- Video conferences
- Healthy Homes booklet
- Exhibits
- DOE, EPA and HUD educational materials

OUTCOMES

Short-Term

Increase knowledge, attitudes, and skills about healthy homes, indoor air quality, and energy in the home.

Medium-Term

48,895 homes tested, 6,536 mitigated for radon
26,008 carbon monoxide detectors installed
26,437 fewer children exposed to second-hand smoke in the home
33,192, corrected combustion appliance problems 51,689 corrected mold and mildew problems in homes
7,358 took action to remove asthma triggers (carpets, etc.)
20,617 tested homes for lead and 1,357 abated for lead
1,122,154 consumers in existing homes were reached with energy information
567,333 consumers adopted energy practices

774 homes were evaluated for energy efficiency
In addition to the above, 250,318 consumers were reached with Healthy Homes information they used to prevent falls, for fire, electrical and disaster safety issues, and for air and water quality issues.

Long-Term

Improve health and safety in the home, including:
Reduce injuries, deaths in the home from unintentional causes
Reduce deaths attributed to lung cancer
Reduce emergency room visits by youth with asthma
Reduce incidents of asthma attacks
Lower asthma rates for children
4,693 new energy efficient homes were built to reduce energy demands and lower energy costs.

Impact

\$672,510.00 was saved in one year as a result of energy saving practices

SUCCESS STORIES

Healthy Indoor Air for America's Homes

This USEPA/USDA/CSREES national program's goal has been to improve the quality of indoor air in homes and improve the health of Americans living in those homes. Forty-seven states, DC and two territories participated with each creating a unique program to deal with their issues, demography, partners and outreach capacity and managed by a state program manager.

Over 161,120 individuals were trained in 4,949 train the trainer sessions, including extension educators, health officials, teachers, builders, realtors, child care providers and others. In addition, 4,237,456 consumers were reached directly and 28,130,163 indirectly through social marketing. The website for this program received 194,133 inquiries. As a result of the new knowledge they received, 48,895 consumers tested their homes for radon, 6,536 mitigated these homes when they found they had high radon levels, 26,437 families stopped exposing their children to secondhand smoke, 25,538 consumers corrected mold problems in their homes and 26,151 corrected moisture problems, 7,358 reduced indoor asthma triggers, 20,617 tested their homes for lead and 1,357 abated for lead, and 166,661 adopted other indoor air behavior changes.

New partnerships were formed or strengthened and on the average, there was \$6.00 invested in outside support for every \$1.00 invested by CSREES. The outreach program stimulated and encouraged the development of research and education programs in most of the states that participated in the program. As a result, the Southern Regions started the Children's Environmental Health Program.

Healthy Indoor Air for America's Homes received a Presidential Proclamation and the Priester Award for multi-state programming in 2005. See www.healthyindoorair.org

Children's Environmental Health

Protecting children from environmental risks is fundamental to EPA's mission. Children are more vulnerable to environmental risks because their nervous, immune, digestive and other systems are still developing and their ability to metabolize or fight toxins may be different from adults.

EPA Region 4 (Atlanta) is partnering with CSREES and the land-grant states in Region 4 to focus education, outreach and compliance assistance efforts on how lead and pesticide use affects children. These include advisory committees, Web sites, exhibits, resource directories, training programs, health fairs, media releases and program development. These materials have been distributed to over 80% of the counties (almost 600) in the eight state region.

Healthy Homes including Louisiana House and the Utah House

Healthy Homes is a USDA/CSREES and U S Department of Housing and Urban Development jointly funded national consumer education program addressing the health and safety needs of children. In its fifth year, this program has supported projects in 40 states and territories including the following.

In Michigan, EFNEP paraprofessionals included lead education information when visiting the homes of clients. Utah, Louisiana and Alabama (Tuskegee) have all developed sustainable homes and model homes to demonstrate and educate the public and home builders about resource efficiency, healthy homes, durability and affordability. See www.uwex.edu/healthyhomes.

Energystar and the Build America Program

Energystar (funded by USEPA and USDOE) and the Build America Program (funded by DOE and administered by NASULGC) are new programs added to KA 804.

The goal of Energystar is to educate the public about Energystar including high-efficiency homes, appliances, consumer electronics, office equipment, windows, lighting and building materials. Seventeen states were chosen for this program. The success (see outcomes) encouraged DOE to develop a pilot outreach project using research materials from their Build America Program.

The goal of the Build America Program is to move high performance home training resources developed with our country's leading production home builders into the network of county extension educators through the state extension housing specialists. All seven states in the first year of the pilot project developed active outreach programs searching home builders and consumers in the final year of the program, 2004. The program focused on the southern region in 2005. See www.energyextension.com.

Connected to the Earth

Connected to the Earth is a do-it-yourself risk assessment tool for Native American homeowners to evaluate environmental and health risks in and around their homes. Developed by the Montana State University Extension Housing program with support from USDA/CSREES and based on the national Home-A-Syst program, material was specifically adapted for Native American audiences and is being used by the 1994 land grant institutions as well as other Native American institutions. From keeping drinking water safe to avoiding household hazards like lead-based paint, this series of 11 fact sheets tells how to detect hazards and get started on reducing or eliminating them. Other topics include: Site Assessment, Drinking Water Safety, Septic Systems, Hazardous Household Products, Lead, Yard and Garden Care, Diesel and Other Fuels, Indoor Air Quality, Heating and Cooling Systems and Energy, and Household Waste. See www.peakstoprairies.org/library/connectedtoearth.cfm. Over 2000 copies were distributed to tribal college and housing authorities in the past three years.

The Breast Cancer and Environmental Risk Factors (BCERF) program

The Breast Cancer and Environmental Risk Factors (BCERF) program, Cornell University, through web-based materials, national satellite conference, workshops, and other media provides scientists, policy makers, health professionals, the agricultural community and the public with science-based information on environmental factors (agrochemicals, diet and lifestyle factors) and the risk of breast and other cancers. The project critically evaluated human, experimental animal, and other data in peer-reviewed and unpublished studies on the cancer causing potential of selected agrochemicals. Critical Evaluations (CEs) are peer-reviewed and then translated into fact sheets written for those who do not have a scientific background. An interactive web-based database on the cancer risk of over 100 pesticide active ingredients, linked to over 2,000 pesticide products used on turf, has been developed. A total of 53 fact sheets and related searchable bibliographies for each topic are now posted on BCERF's web site <http://envirocancer.cornell.edu/>.

The BCERF environmental risk factor database was expanded to 9,616 total citations. Three tip sheets for low literacy readers were revised, printed, and posted on the BCERF web site. Review articles and electronic research updates were nationally disseminated to policy makers, scientists, and environmental groups. BCERF faculty advised on three NIH panels on cancer and the environment. BCERF educational activities reached 20,000 nurses, 140 genetic counselors, 6,000 dietitians, 202 extension educators, and 200 scientists and consumers via distance learning, workshops, and targeted mailings.

Extension educators participating in workshops reported increased knowledge of cancer risk and capacity to help consumers make informed lifestyle choices, and plans to use cancer risk reduction at work. Formative research with teachers revealed frustration and distrust of cancer information, critical cancer experiences, and revealed unique opportunities for addressing cancer risk. Other states have since adopted this project and are disseminating materials. (CRIS# 0188551)

Extension Disaster Education Network

The Extension Disaster Education network (EDEN) was established in 1994 following the floods in the North Central Region. EDEN formally organized the diverse expertise of the land-grant system to better serve the public. The destruction left by Hurricanes Katrina and Rita affected millions of people and decimated much of the region. The destruction left by Hurricanes Katrina and Rita affected millions of people and animals; demolished housing, businesses, and portions of the Gulf aquaculture industry; and harmed state-wide environmental areas. CSREES and the Land Grant System responded to this devastation through EDEN. The network's mission is to reduce the impact of natural and man-made disasters through education. Resources are contributed by member land-grant institutions and made available online at <http://www.eden.lsu.edu>. Currently, 49 states, Guam, and Puerto Rico are represented with land-grant institutions as members of EDEN. When Hurricane Katrina made landfall, information management was maintained at Purdue University. The most severely affected states – Louisiana, Mississippi, Alabama – and then Texas were contacted to determine what was needed. In response, additional educational resources about human trauma and stress, financial management, food and water safety, well decontamination; housing; mold and moisture; animal feed and hay; shelters and disposal; and generator safety and use were added to the site. A list of contacts to provide information about topics like post-disaster community development and planning was quickly developed and posted. The site received 142,000 hits in September.

EDEN also established a working relationship with eXtension and set up a FAQ system for the four affected states. Because immediate information was needed, the technical turnaround time for this system development was very rapid.

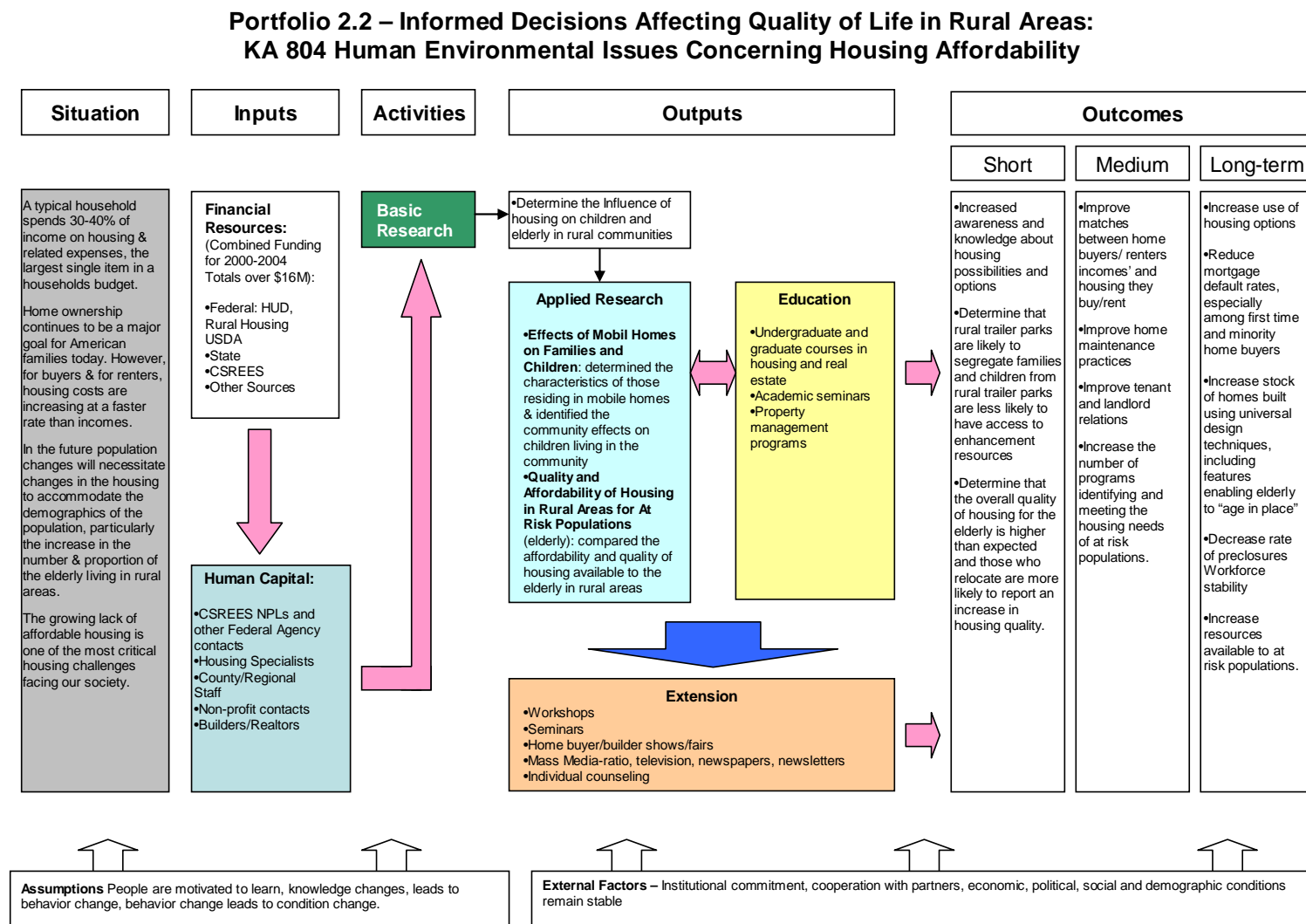
As a result of successful work with NASULGC and DOE'S Building America Program, financial and technical support were extended to support housing programs as the states begin to rebuild much needed housing. The Louisiana House on the Baton Rouge campus of Louisiana State University, a model house showcasing sustainable housing including multi-hazard resistant construction, has been the focal point for these efforts. The Louisiana State University AgCenter's work on the LaHouse and on education and training for code compliance was reflected in Louisiana's new Statewide Uniform Building Code, adopted by the Legislature in November, 2005. The new code tracks the International Residential Code. Emergency provisions for wind and flood resistance are already in effect in some of the most affected coastal parishes. Eden has been selected as a pioneering Community of Practice for eXtension. See www.eden.lsu.edu

HOUSING AFFORDABILITY

Housing Affordability: focuses on home buyer and tenant/landlord issues including tenant/landlord education, pre-purchase home buyer education and counseling, mortgage

delinquency counseling, home maintenance, and post-occupancy education. Research, outreach, and education efforts are included. Work focuses on first-time home buyers, renters, and the elderly.

Figure 25 – KA 804 Logic Model – Housing Affordability



SITUATION

A typical household spends 30% to 40% of income on housing and related expenses, the largest single item in a household's budget. Homeownership continues to be a major goal for American families. Over two-thirds of families purchase their homes. For some buyers and for renters, housing costs are increasing at a faster rate than incomes are, especially home prices, taxes and utilities. The housing affordability problem for very low income households requires that either incomes be raised or the supply of housing units they can afford be increased. In the future, population changes will necessitate changes to accommodate the changing population demographics, particularly the number and proportion of the elderly living in rural areas. The growing lack of affordable housing is one of the most critical housing challenges facing our society.

Between 1965 and 1990, Americans invested over \$60 billion in a supply of affordable rental housing. These low-cost apartments in cities, suburbs, and rural communities were intended not only to shelter people with low incomes, but also to improve distressed neighborhoods, provide for mixed income communities, and ensure opportunities for seniors to live close to community and family. But this housing is increasingly at risk.

Most affordable housing built in this period was financed or subsidized through federal assistance agreements that will expire if not renewed. This housing is subject to an elaborate mix of federal laws and regulations that have changed repeatedly over the last forty years. As a result, building owners and local officials may have little knowledge of the renewal process for the original agreements with the Department of Housing and Urban Development or the USDA, for properties developed in rural areas. Of the 1.4 million houses and apartments subject to these agreements, some are renewed without complication. But many others — numbering in the hundreds of thousands — are at risk of being lost.

In some thriving areas, owners may see an opportunity to stop participating in public programs and replace their less-affluent tenants with people who can afford much higher rents. In poorer communities, owners may lack the capital or the technical knowledge to make necessary improvements and qualify for renewal. Owners willing to consider selling to a nonprofit organization or some other owner who would preserve its affordability still may find it hard to locate capable preservation-oriented buyers. In other cases, taxes on the transfer of the property may make it seem uneconomical to sell. Most housing development subsidies are shrinking or limited, but land, material, and labor costs have risen sharply in most places. Approval processes and zoning problems often delay or block new construction projects. Finding ways to increase the stock of affordable housing is difficult, especially in rural areas.

ASSUMPTIONS

People are motivated to learn, knowledge changes, leads to behavior change, behavior change leads to condition change. If producers and consumers (renters and home owners) have better information about alternatives that would be attractive to other parties in the housing market, demand will increase for affordable homes built with Universal Design, “green” methods and materials, and supply of such homes will increase. Increases in home ownership increase commitment to communities, encourage civic engagement, and increased quality of life in rural America.

EXTERNAL FACTORS

Factors that can help or hinder achieving results in this area include institutional commitment, cooperation with partners, economic, political, social and demographic conditions.

OUTPUTS

Services offered with CSREES funding (and leveraged funds) include:

- Homebuyer/builder shows/fairs
- Workshops and seminars
- Individual counseling
- Printed educational materials
- Mass media
- National video conferences

HomeWorks News

HomeWorks News is a series of four easy-to-read seasonal newsletters designed to provide timely information to new, particularly first-time, homeowners.

While first-time buyers often receive special assistance about buying a home, they are usually on their own once they move into that home and must face unfamiliar challenges that come with home ownership. HomeWorks News quarterly 8-page newsletters are written to help new homeowners face these challenges and succeed as homeowners.

They are designed for distribution by lenders, real estate professionals, counseling agencies and extension county educators. Originally developed by the University of Wisconsin extension, the newsletters are distributed throughout the North Central region. Direct readership is approximately 10,000 people annually.

The National Center for Housing and the Environment (NCHE)

The National Center for Housing and the Environment (NCHE) in partnership and with financial support from CSREES established a consortium of university faculty to generate research priorities on natural resource and environmental issues intersecting

with housing. Twenty-five faculty members representing a range of disciplines (architecture, agriculture and resource economics, city and regional planning, forestry, housing and community development, and landscape design) met with members of the Housing Education and Research Association at Virginia Tech in 2004 and developed a research agenda on issues such as policy options for land use at the rural-urban fringe, analysis of farmland preservation policies, low density development and rural sprawl, and housing development impacts on water quality. A summary of the meeting appeared in *Housing and Society*. (See evidentiary materials)

OUTCOMES

Short-Term

Increase awareness and knowledge about home buying, renting process, housing options and alternatives, mortgage and finance options, tenant responsibilities, home maintenance. Improve knowledge by elderly on “aging in place” rather than moving to new homes.

Rent Smart

While two-thirds of American households are homeowners, one-third continue to rent and need educational information tailored to their needs. Rent Smart is a teaching guide designed to be the core of a community tenant education program to help individuals develop the life skills necessary to become successful tenants. Developed by the University of Wisconsin-Extension, this outreach program is being used throughout the North Central States region and reaches approximately 4,000 tenants and landlords annually.

In **Effects of the Built Environment on Older Adults (0190718)**, Gentry and Webb, collected data on residents of two assisted-living facilities and one independent living facility with similar philosophies of care, size, and services in the southern US. Findings indicate that assisted-living residents have firmer boundaries than independent-living residents. Assisted living residents, for this reason, share personal belongings and room features with other residents/roommates less than independent-living residents do. Assisted-living residents experienced their rooms as more personal and expressive of self than independent-living residents. Furthermore, independent-living residents evaluated their living spaces as more comfortable, more personal, more open, and quieter than assisted-living residents evaluating their own living spaces. The size of the preceding environment was also related to evaluation of having things of value/importance in the present living space, reflection of self and reflection of the facility in the private living areas. This research will aid developers, architects, and long-term care administrators in the planning and design of congregate living environments for older adults. Territoriality and crowding are significant to adjustment in any novel environment and the provision of

architectural mechanisms contributes to quality of life. Older adults will benefit from the increased sensitivity of designers and caregivers.

Quality and Affordability of Housing of Rural Households at Risk, University of Georgia, (0172827). Using data collected through the American Housing Survey (AHS), at risk elderly Americans living in rural areas are the primary focuses of this study. The results indicated: the overall quality of rural elderly homes was high, those who moved from their homes had significantly higher housing costs than those who stayed, elderly who stayed were more likely to be homeowners and more likely to have lower quality housing, and elderly who changed from renters to home owners were more likely to report an increase in housing quality.

Medium-Term

Support policies to increase the stock of affordable housing.
Improve match between home buyers/renters incomes' and housing they buy/rent.
Improve home maintenance practices.

Quality and Affordability of Housing of Rural Households at Risk, University of Georgia, (0172827). Southwest Georgia Housing Development Corporation used the survey results described above to support a proposal to the Rural Housing Service for funding of an assisted living/Alzheimer's facility being built in Cuthbert, GA. The project was granted \$4 million and led to a Housing Needs Assessment project being conducted in 26 counties in Southern Georgia. The product of the needs assessment highlighted and supported the need for a major study on Workforce Housing in Georgia sponsored by the Department of Community Affairs in 2001. See the report, Workforce Housing in Georgia, available November 10, 2005 at <http://www.fcs.uga.edu/hace/docs/Workforce%20Housing%20in%20Georgia.pdf>

Long-Term

Increase stock of affordable housing.
Increase use of housing options.
Reduce mortgage default rates, especially among first time and minority home buyers.
Increase stock of homes built using universal design techniques, including features enabling elderly to "age in place".

Quality and Affordability of Housing of Rural Households at Risk, University of Georgia, (0172827). The Georgia Department of Community Affairs (DCA) recognized the affordable housing challenges facing rural Georgia and implemented an innovative initiative to assist rural Georgians in obtaining affordable housing. DCA commissioned the University of Georgia Housing and Demographics Research Center to ascertain housing needs in rural Georgia, resulting in a report, Workforce Housing in Georgia. The

report showed that affordable housing opportunities for the citizens and workforce of rural Georgia communities were declining.

Working with Gold Kist Inc., in Ellijay, Georgia, the partnership began addressing the housing needs of the Gold Kist workforce (approximately 1,500 workers, three-fourths of which speak Spanish only). The partners -- DCA, USDA/RD, the University of Georgia Cooperative Extension Service, Gilmer County Family Connection, United Community Bank, and Gold Kist Inc. -- addressed issues of communication for the non-English speaking employees, social services, homebuyer education, and low cost, long-term, fixed rate mortgage financing. The partnership marketed this program to the Gold Kist employees through homebuyer awareness fairs, homebuyer education classes, financial counseling, and ultimately assistance with the loan application process.

The target audience is first-time homebuyers whose income based on household size is 80% or below the area median income for Gilmer County. As household incomes were low, layered funding sources were needed that could provide more flexibility than that in conventional mortgage products. United Community Bank and USDA/RD provided alternatives to the normal loan products. For examples, the USDA/RD 502 Direct Loan could be leveraged with the DCA Home Buyer Loan, and when necessary the DCA OwnHOME down payment assistance loan. As funding levels for the USDA/RD 502 Direct loan were low, the state office for USDA/RD in Georgia applied for special funding under the Rural Home Loan Partnership program and was awarded \$1,495,600 to be leveraged with the DCA Home Buyer loan originated by United Community Bank.

Homebuyer education was provided through of the University of Georgia Cooperative Extension Service, Gilmer County Family Connection, and United Community Bank. United Community Bank, USDA/RD, and DCA partnered to provide funding opportunities in order to provide low cost financing options for these homebuyers. United Community Bank provided the staff resources to originate, process and close these loans.

Working together as a team, the partnership has generated close to \$1.5 million and the construction of 11 new homes for employees of Gilmer County's largest industry, the poultry business. Prior to this USDA/RD had not originated a loan in the area in the preceding five years. See report available November 10, 2005 at http://www.ncsha.org/uploads/GA_BluePrints.pdf.

SUCCESS STORIES

Manufactured Housing in Georgia (0197626)

This study compared the possible quality and cost differences between on-site and manufactured built homes. Using data from the American Housing Survey, results suggested that there is a stigma attached to manufactured homes, which drive down the value of these homes even though their quality is comparable to on-site built homes.

Research findings educated consumers and policy makers on the comparable quality of manufactured homes and made them aware that manufactured homes' lower costs are due to savings in manufacturing processes and materials, rather than a lack of quality in construction. The results gave policy makers insight about manufactured homes and those who reside in them. Lastly, the research has provided greater understanding concerning what causes people to feel proud of their home.

Interlocking Construction System (0189577)

With rising costs and declining housing quality in rural America, the Interlock Construction System (ICS) offers new technology to solve the housing problems in rural America. The results of this study suggested that it is possible to build a low cost quality home. The results indicated that construction of ICS is not difficult and ICS has comparable structural strength compared to on-site or current housing manufacturing technologies. It offers the potential for: 1. providing quality low cost home construction in rural areas, 2. reduces on-site labor costs when sections of the home are pre-fabricated, 3. because of smaller size panels, it reduces transport costs.

Homes Across America

Some consumers may be overwhelmed by choices and options in the housing market. A web site called Homes Across America focuses on resource efficient and high performance home building across the U.S. which offers local and unbiased technical assistance for building "green". Homes across America was developed by Montana State University Extension Housing Program. See <http://homes-across-america.org>, available November 10, 2005.

NEW DIRECTIONS

New challenges and needs are emerging as new issues or directions that must be addressed by this knowledge area in the future.

Energy conservation and use in new and existing housing sustainable natural resource use needs to be reemphasized with outreach, research and higher education. Alternative energy sources need to be explored and used to a greater extent including solar and wind.

Aging population issues and affordability including topics such as reverse annuity mortgages, universal design and aging in place, environmental issues for an aging population such as breathing and heat will be important issues as the baby boom population ages. However, one of the challenges is to produce housing for older people who seek retirement housing but cannot afford market prices. However, some older people stay in their homes long after they would have benefited from a more supportive environment. A variety of home modifications as well as good space planning can help older adults live independently and safely.

EDEN has become widely known and recognized as a valuable resource for disaster information by organizations and agencies such as the American Red Cross, the Federal Emergency Management Service (FEMA), the Department of Homeland Security, and USDA's Animal and Plant Health Inspection Service. EDEN's diverse information can be applied under different disaster scenarios.

During Katrina, EDEN demonstrated the critical effectiveness of the integrated relationship between CSREES and the state Land-Grant and Sea-Grant Partners. EDEN coordinators and the Land-Grant System will continue to improve the availability of information before, during, and after disasters to reduce devastation and destruction.

The lessons of hurricanes Katrina and Rita have taught us the importance of being proactive and working to prevent or at least minimize damage from hurricanes, floods, fire, hail, etc. More work is needed on siting housing to reduce exposure to hazards, and on improving the durability, functionality, and affordability of new housing. Property management programs/courses in response to the increased need for trained and knowledgeable professionals to work in rental housing, condominiums, cooperatives as well as the booming retirement housing industry.

Obesity and the built environment is an emerging issue as Americans drive everywhere today. Communities are not designed to allow walking or bicycling to work, school, or to shop. More user friendly community designs incorporate sidewalks, good lighting, nearby stores and schools encourage pedestrian traffic and lessen the need for the automobile. This concept is known as New Urbanism.

A related issue is that of land use/ connections to the environment. As land becomes more developed, growth places increasing pressure on the natural environment. Every single minute of every day, America loses two acres of farmland. New land use and housing configurations including concepts such as smart growth need to be explored and understood in order to make the best use of land resources.

Basic research will be needed on new plant-based fibers and textiles.

Additional work on transgenic cotton fiber quality, fiber strength, cell development as well as among developmental stages as well as differences among species will address porous structure inside fibers, a basis for nano- and biobased materials science from agricultural components and materials. Research in this area helps to build basis for nano-materials science and has long-term implications high value-added applications of agricultural components and materials.

Better fitting, better functioning, and less expensive protective clothing to protect against bio-hazards is needed.

There is also a need to develop what is being termed "workforce housing" for those households that work in a community and cannot afford to live there. They are too rich

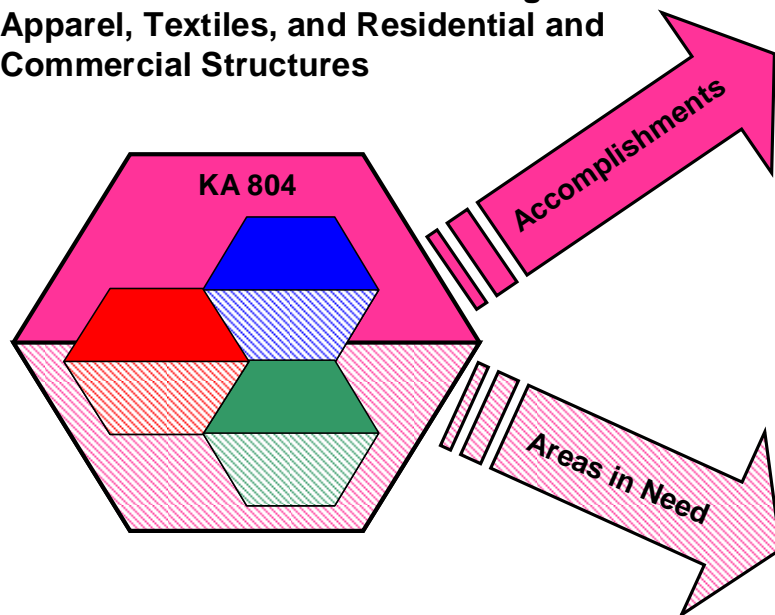
for subsidized housing and too poor to purchase or rent the housing that exists in the community in which they work. Out of necessity, they are often forced to commute long distance to their places of employment. Teachers, police and fireman are often those who cannot afford to live where they work.

Lastly, there is need for further study to understand and develop affordable alternatives to the traditional stick-built single family housing for low and moderate income households. Manufactured housing, townhouses and other forms of multi-family housing are some of the alternatives that need further research and understanding.




Breast Cancer and Environmental Risk Factors (BCERF), Cornell, strives to better understand the relationship between breast and other cancers and environmental risk factors (including diet and lifestyle). Increasing attention will be paid to overweight and obesity as modifiable risk factors for breast cancer, and to improving environmental approaches to obesity prevention and breast cancer risk reduction.




Figure 26 – KA 804 Honeycomb


Knowledge Area 804: Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures



KA 804 - Major Themes

-  Apparel and Textiles
-  Indoor Environmental and Health Safety Issues
-  Housing Affordability

-  •Increased awareness and knowledge regarding environmental hazards associated with fabric
- Understanding of a better need for protective clothing, factors affecting acceptance and use, and development of products to address unmet needs
-  •Increased knowledge about indoor air quality, healthy homes, and energy in the home
- Homes tested for environmental hazards
-  •Increased knowledge of effects of housing environments on families
- Increased knowledge on housing options

-  •New plant-based fibers and textiles research
- Better fitting, better functioning and less expensive protective clothing to protect against bio-hazards
- More research to build basis for nano-materials science
-  •Energy conservation and use in new and existing housing emphasizing sustainable use of natural resources
- Disaster resistant housing
- Obesity and the built environment
- Land use connections to the environment
-  •Addressing aging population & affordability issues
- Property management programs/courses
- Housing alternatives and workforce housing

Knowledge Area 805: Community Institutions, Health, and Social Services

OVERVIEW

Health impacts every aspect of individual and community well-being. Although as health care spending has risen to \$1.4 trillion (2001), health disparities still exist and 40.5 million uninsured Americans under the age of 65 have very limited access to medical care. A large number of the uninsured are children. Inadequate healthcare can clearly undermine worker productivity and thus the economic power of American communities.

The health care sector, a vital contributor to local economics, especially in rural areas, is being compromised by hospital closings, decreases in services, and shortages of medical service providers. The public is assuming more responsibility for understanding medical information, acute and chronic disease self-care, medication directives, the health care system, and health provider information. Health care costs continue to rise while the health care system continues to become more complex. Reasons for rising health care costs include technological advances, new drug therapies, malpractice costs, and a growing aging population. But a less recognized reason is the costs incurred by patients who do not understand medical information, their health care system, and their health provider's instructions.

This public health problem is called low health literacy, the ability of individuals to obtain, interpret and understand basic health information and services and to use such information and services needed to make appropriate health decisions. Limited understanding is a challenge for people from all ages, races, cultures, income and educational levels. Half of adult Americans struggle with understanding common health care information, such as prescription drug instructions, test results, insurance forms, and chronic disease self-management¹. This has resulted in a knowledge and behavior gap between the medical and public health innovations and the delivery of day-to-day information and services the public needs to lead longer and healthier lives.

The concern about health literacy has gained momentum since 1990 due to the recognition that limited health literacy has profound economic consequences. It is estimated that low health literacy costs the U.S. health care system \$30 billion to \$73 billion annually. ²A recent study, **Health and Productivity Among U.S. Workers**, estimated \$260 billion per year in economic output is lost due to health reasons.

¹ Carmona, R.H. Health Literacy: Key to Improving American's Health. Pfizer Sixth National Health Literacy Conference, September 19, 2003.

² Academy of an Aging Society. Fact Sheet: Low Health Literacy Skills Increase Annual Health Care Expenditures by \$73 Billion, 1999. http://www.agingsociety.org/agingsociety/publications/fact/fact_low.html.

The U.S. Surgeon General has identified health literacy as the “currency for staying healthy.” noting, “The ability to access, understand and use health-related information and services is critical to the success of three national priorities: improving emergency preparedness, eliminating health disparities, and preventing disease.” The American Medical Association has called health literacy a hidden problem of the health care system. The Institute of Medicine of the National Academy of Sciences has identified health literacy as a national health priority. Healthy People 2010, a nationwide health promotion and disease prevention initiative by the Department of Health and Human Services, has identified closing the gap in health literacy as fundamental to fairness and equity and essential to reducing health disparities. The Secretary of the U.S. Department of Health and Human Services has stressed that “the health of our country depends on our understanding of basic health information in order to lead a healthy life.”

Research has linked limited health literacy with poorer self-management of chronic diseases. Less knowledge about a variety of health behaviors has been documented in several studies. A higher rate of hospitalization due to limited health literacy has been reported. Other studies correlated poor health with limited health literacy. Comprehensive bibliographies on the scope of the problem, and strategies for addressing it have been compiled by the National Library of Medicine.

Low health literacy coupled with no health care coverage for millions of Americans contributes to higher utilization of health care services resulting in medical expenses that are up to four times greater than patients with adequate health literacy skills. Research has shown that Cooperative Extension programs to increase health literacy skills concerning diabetes self-management and daily physical activity result in an economic savings in health care and lost wages.

The Land-Grant System is a key player in closing the gap between what Americans know and should know about their health and the health care system. The Cooperative Extension System can mount additional efforts to combat low health literacy and support the informed decision-making of citizens. With closer linkages to the broad research base of the university community, new areas for collaboration and outreach are maximized.

Extension can reach people in different ways than traditional health care organizations. Extension educators work with audiences at high risk such as seniors, low income groups, persons with chronic diseases, minority audiences, rural audiences, employees, non-English speakers, parents and pregnant women. As the vital link connecting research-based resources in counties across the country, extension presents information in a useful and meaningful manner. This produces health literate Americans by imparting knowledge needed to obtain, interpret, and understand health information and services and to build the necessary self-efficacy to use the information and services in ways to enhance, maintain, and protect health of Americans and their families. Campus alliances and collaborations with other agencies and organizations will continue to enhance outreach activities.

The focus of the health literacy initiatives of national groups such as the American Medical Association, Pfizer and others address communication between patient and health care providers

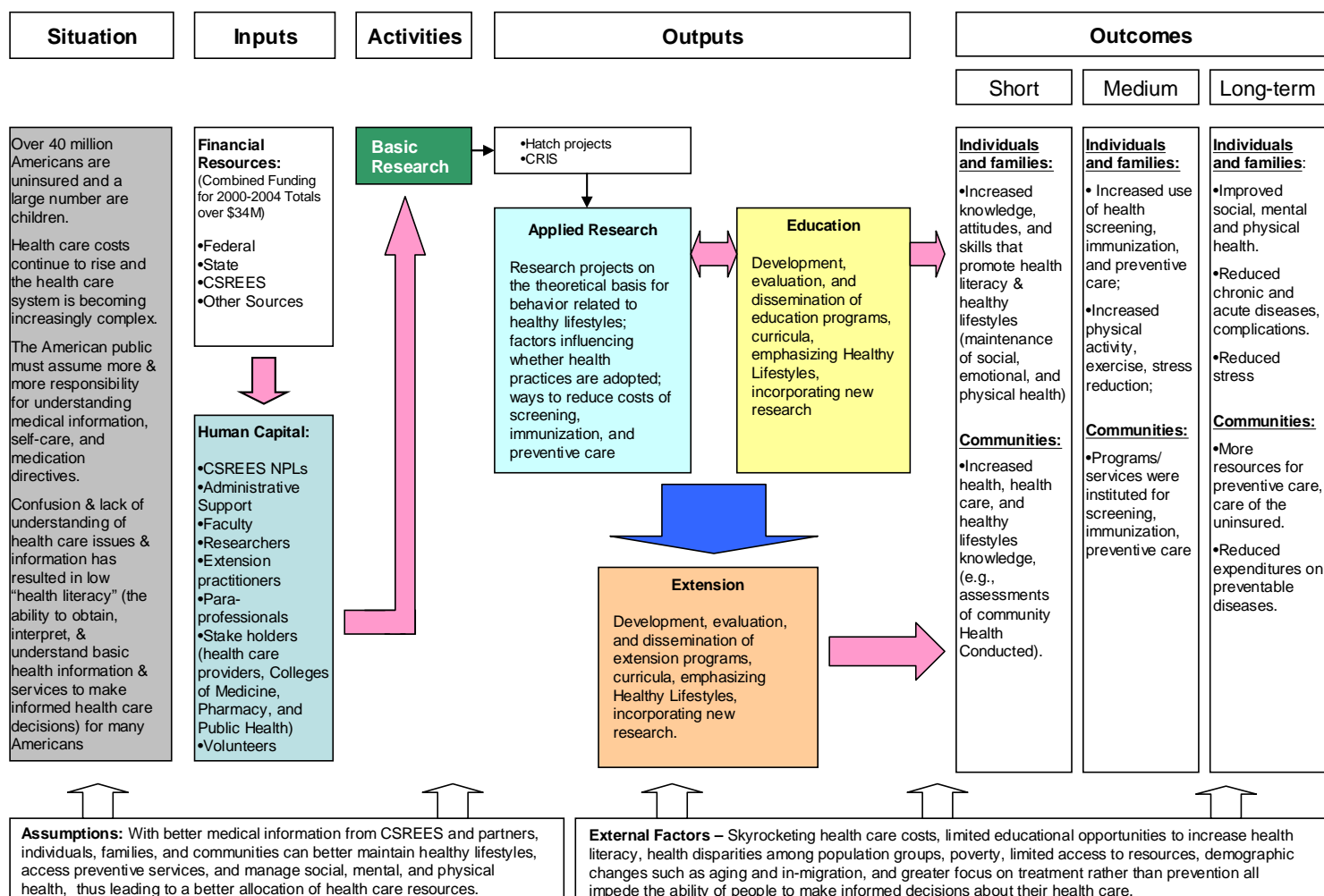
within a health care setting. Extension addresses health literacy of the public in a broader context which includes both patient skills and consumer health skills, such as understanding health risks, recognizing credible health information, understanding the role of lifestyle on promoting and protecting health, and understanding the different types of acute and chronic diseases. Improving the health literacy of the public will improve the communications between patients and their health care providers within a health care setting.

Extension provides education outside health care settings. There are no competing needs for reimbursement, handling emergencies or other jobs to do. Educators are intensively trained in a particular health subject for the sole purpose of assisting clients to improve the quality of their life through an active participation in their medical care. Extension provides a cadre of skilled community educators who can make health knowledge understandable and usable for the learner.

Addressing health literacy requires establishing partnerships with other national, state and county health organizations. At the national level, CSREES is partnering with other national organizations such as the American Cancer Society, National Cancer Institute, Centers for Disease Prevention and Control and the Centers for Medicare and Medicaid Services. State-level Extension is partnering with other units in the Land Grant System such as Colleges of Pharmacy, Dentistry, Agromedicine, Nursing, Social Work and Medicine as well as state health departments and other health agencies and nonprofit organizations (such as the state affiliates of the Arthritis Foundation, American Cancer Society and American Diabetes Association). At the local level, in particular, Extension educators are the facilitators and supporters of strong local health literacy activities that are informed by community members, responsive to community needs and linked to community assets. These are key competencies required to address community health issues.

Figure 27 – KA 805 Logic Model

**Portfolio 2.2 – Informed Decisions Affecting Quality of Life in Rural Areas:
KA 805 Community Institutions, Health and Social Services**



SITUATION

The research, education, and extension missions have health and well-being as over arching themes in the agricultural sciences, human sciences, youth development, community resource development, and public policy arenas. The health portfolio addresses a broad array of issues including home, farm, and community safety, wellness and fitness, and disease prevention and management. Health programs have clear linkages to nutrition research and education, food safety, AgrAbility and farm safety, pesticide safety, air and water quality; all programs administered by CSREES.

In 1998, the Extension Committee on Organization and Policy (ECOP) of the NASULGC identified health as a growing national priority that merited additional emphasis. In partnership with CSREES a national initiative was established to identify research, education, and Extension efforts and to explore emerging opportunities in health programming for the Land-Grant System. The initiative entitled, **Healthy People...Healthy Communities** was an active national effort from 1998 through 2004. The mission of the initiative was to promote the capacity of individuals, families and communities to improve healthy behaviors and lifestyle choices and make informed health decisions. The initiative brought together Cooperative Extension, teaching and research resources of the Land-Grant University System and its stakeholders to address health and health care issues. As a result of this initiative, extension is positioned as a member of the community health network at the national, state and county levels.

Land-Grant Universities recognize health research and education as a priority area. Twelve universities have full-time faculty employed as state Cooperative Extension health specialists and a number of universities have faculty members with a portion of time assigned to leadership for health education in extension. Many of these have academic backgrounds in nursing or public health. Most of these are joint extension and teaching or research appointments. A number of states have identified the need to add extension health specialists when funding is available. There has also been a merger of human science and health programs within the academic structure of some universities. For example, in 2001, Oregon State University merged the College of Health and Human Performance and the College of Home Economics to create the College of Health and Human Sciences. Dr. Tammy Bray, Dean of the College says it was a bold move to bring together five departments and one Extension program to “become a pioneering discipline that addresses the human problems of the 21st Century.” The College theme; “**Taking Care of Life**” gives energy and a broader context to their mission by addressing the biological, physical, social, and emotional needs of individuals across the lifespan”.

At the University of Nebraska Lincoln, Teachers College and the College of Human Sciences and Family Studies merged to create the College of Education and Human Sciences. This new college incorporated programs in health and human performance and exercise science with nutrition to create a new Department of Nutrition and Health Sciences. At the University of Missouri Columbia, the School of Social Work was brought into the College of Human Environmental Sciences. Just recently at Missouri the College of Human Environmental Sciences formed a collaboration with the School of Health Professions, the School of Medicine,

the College of Education, the College of Arts and Science, and the Sinclair School of Nursing to establish the Thompson Center for Autism and Neurodevelopmental Disorders. Additionally, the University of Tennessee created a new college, the College of Education, Health, and Human Sciences again creating a formal alliance between health and the human science disciplines.

A number of health science disciplines have placed college students in County Extension Offices for community-based service learning opportunities or internships. The impact of these efforts shows promise for expansion. With the growing focus on health education, preventive education, and increasing health literacy, this practice has potential for graduates to be better prepared to collaborate and address health issues from a community perspective.

Increasingly, universities' (Missouri, Illinois, Kentucky), Extension Health Specialists/faculty have joint appointments in Public Health, Medicine, or related health disciplines to provide for a synergy that addresses health in a broad context and allows universities to better meet the needs of clientele. It is timely to forge collaborations between academic health programs such as pharmacy, nursing, public health, medicine, dentistry, and Cooperative Extension. The most notable of these has been the collaborative work at the University of Tennessee between the College of Pharmacy and the Cooperative Extension program. In their joint program, a pharmacist is employed and officed with the extension program to enhance integration.

Another innovation in Cooperative Extension is to employ a health specialist jointly with another agency. For example, the Alabama Cooperative Extension System and the Cancer Information Service of the National Cancer Institute jointly employed an individual to address cancer information and screening.

Increasingly, political leaders, advocates, researchers and public administrators recognize that the health of individuals and communities cannot always be supported within the constraints of individual agencies, programs, or funding silos. The importance of collaboration and cooperation in health promotion is increasingly common both from the perspective of providing effective services to individuals and communities and that of efficiently stewarding limited resources. Interagency coordination and collaboration are key elements in effectively delivering programs and services to meet the needs of individuals, families, and communities throughout the nation. The efficiency with which these efforts can be accomplished requires the willingness of all parties to carefully select mission-related priorities that have the most probable likelihood of success. Setting these priorities ensures that limited dollars are used in the best way possible.

The objectives of CSREES' work in KA 805 deal with issues related to community institutions, health, and social services. Close examination of the projects revealed that only two were 100 percent 805. The rest of the projects labeled 805 with frequently no more than a 10% content in KA 805.

Because of the limited scope of 100% 805 research projects and the growing body of work in health, this paper highlights the health programs that emanated from those projects from FY2000 through FY2004. Significant efforts have been made to determine the extent to which work

funded by CSREES has made a difference in terms of scope, scale, and effectiveness of public and private community institutions and services, including emergency preparedness and response, health services coordination, and public safety.

These areas compliment and are integrated with a wide variety of KAs in the CSREES strategic plan, and in particular, with ongoing research, education, and extension in the emerging work of KA 724- Healthy Lifestyles, which concerns activities related to individual and community health. KA 724 increases health literacy by addressing healthy lifestyles such as physical activity, exercise, stress management, and health-related practices including screening, immunization, and preventive care. KA 724 also should reflect work in community development and related fields that address issues of an individual's or family's near environment and will be discussed in the New Directions section of this paper. This broader ecological approach including the community is fundamental because as much as 20% of the economic engine in a county is from the health sector. If the health sector is not strong community is less able to provide an infrastructure that enhances the health of residents.

Through the nationwide, non-formal, educational network, community educators and state specialists, Extension, teaching, and research resources, can be drawn upon to close the gap in health literacy by:

1. Educating individuals and families to adopt behaviors and lifestyles to promote health and prevent diseases.
2. Educating youth and adults to make informed health and health care decisions to utilize health care effectively and reduce costs.
3. Educating youth and adults to treat acute conditions and manage chronic disease to prevent the progression and complications.
4. Building national, state and community capacity to improve and support the health of the nation through health literacy education.
5. Preparing the next generation of health care professionals.
6. Conducting research that establishes best practices for increasing the health literacy of Americans.

The work in this area frequently involves population groups at risk not limited to, youth, baby boomers, minorities, low income urban and rural residents, adults with specific targeting to seniors, low literacy audiences, employers and employees, persons with chronic diseases, Non-English speakers, caregivers and childcare providers.

Work is concerned with development of a theoretical basis for behavior related to health literacy and health and well-being. The Extension health program is characterized by community-based intervention programs integrating theory and practice. Theory includes behavior change models, evaluation research methods, and youth and adult learning theories. The practice refers to the uniqueness of learners and their environments at the community-level including social, cultural, health, economic and political systems. Educational strategies include direct teaching, media

activities, Internet programs, newsletters, publications and other educational outlets to address specific health information, attitudes and skills that impact health literacy.

Professional development programs designed and conducted by state health specialists and other program partners are critical to maintaining competent county staff.

Building and sustaining partnerships with national, state and county health organizations and agencies enhances the Land-Grant System's ability to conduct research and deliver health education programs and achieve program outcomes by providing technical expertise, funding and other resources

ASSUMPTIONS

- USDA in partnership with other community-based agencies and organizations is a powerful leader in addressing a range of health issues with research and extension efforts
- When provided with research and educational opportunities, individuals will make effective choices in managing their own health.

EXTERNAL FACTORS

- Rising health care costs...
- Lack of health literacy...
- Health disparities among population groups...
- Greater focus on treatment than prevention...
- Rapidly changing demographics...
- Technological advances...
- Growing stress levels due to terrorism, natural disasters, and economic constraints...

INPUTS

As the Federal partner with the Land-Grant University System, CSREES provides national program leadership across the functional areas of research, education, and extension in the development of effective collaborations to address community issues. This program focus aligns with the CSREES Strategic Goal 2 - to Support Increased Economic Opportunities and Improved Quality of Life in Rural America. Funding for this work relies on formula funds for research and extension, fees for resident education, and grants from non-profit organizations, state and federal agencies, and foundations, and extensive collaborations between various agencies at all levels. Collaborative efforts to support this program have increased as a result of the need to maximize resources across agencies to meet critical community, health, and social service needs.

Table 20 - CSREES-based funding for KA 805

Funding Source	Fiscal Year (in thousands)					
	2000	2001	2002	2003	2004	Grand Total
Hatch	\$679	\$767	\$723	\$498	\$459	\$3,126
McIntire-Stennis	\$48	\$35	\$25	\$15	\$23	\$146
Evans Allen	\$132	\$124	\$206	\$236	\$363	\$1,061
Animal Health	\$0	\$0	\$0	\$0	\$0	\$0
Special Grants	\$252	\$469	\$236	\$180	\$405	\$1,542
NRI Grants	\$136	\$65	\$0	\$224	\$0	\$425
SBIR Grants	\$69	\$0	\$48	\$0	\$96	\$213
Other CSREES	\$13	\$2,146	\$0	\$477	\$160	\$2,796
Total CSREES	\$1,329	\$3,605	\$1,238	\$1,629	\$1,505	\$9,306

Table 21 - CSREES, Federal, State and Other Sources of Funding for KA 805

Sources of funding	Fiscal Year (in thousands)					
	2000	2001	2002	2003	2004	Total
CSREES	\$1,329	\$3,605	\$1,238	\$1,626	\$1,505	\$9,303
Other USDA	\$266	\$339	\$349	\$160	\$211	\$1,325
Other Federal	\$459	\$1,135	\$835	\$252	\$119	\$2,800
State Appropriations	\$2,637	\$3,887	\$3,847	\$3,180	\$2,662	\$16,213
Self Generated	\$246	\$241	\$309	\$303	\$233	\$1,332
Independent/GR Agreement	\$240	\$250	\$265	\$134	\$214	\$1,103
Other Non-Federal	\$365	\$462	\$446	\$352	\$307	\$1,932
Total KA 805	\$5,542	\$9,920	\$7,289	\$6,010	\$5,251	\$34,012
CSREES as % of Total	23.98%	36.34%	16.98%	27.05%	28.66%	27.35%

Funding Analysis

As shown in Tables 20 and 21, CSREES invested a total of \$9.3 million from 2000 through 2004 for KA 805 and other sources totaling \$34 million. CSREES contributed 27 percent of the investment over the 5 year-span. As indicated in Table 21, about 47 percent of total funds for KA 805 come from State Appropriations. A closer look at Table 20 reveals that most CSREES funds come from Hatch, “Other CSREES” Special Grants, and Evans-Allen. Hatch funding has been decreasing over the review period years, Evans-Allen nearly tripled in FY 2004 compared to FY 2000. Investment from Special Grants increased from \$252K in FY 2000 to \$4million in FY 2004. Investment from Special Grants peaked in FY 2001, dropped in FY 2002 and FY 2003 and increased significantly in FY2004.

Healthy Lifestyles received additional funding from the following sources:

- \$2.6 million annually for 2000-2004 in Special Grants/Federally Administered for Rural Health and Safety;

- \$8 million for 2003 and for 2004 for in Special Grants/Federally Administered for Health Education;
- \$150,000 in 2002 and \$300,000 in 2004 from Medicare for Medicare Education;
- \$300,000 annually for 2002, 2003, and 2004 from the National Cancer Institute (NCI) and the Centers for Disease Control (CDC) for the Team-Up Cancer collaboration;
- \$40,000 in 2003 and in 2004 from USDA/CSREES for Team-Up;
- \$20,000 in 2003 from CDC for a conference; and
- \$25,000 in 2002 from Merck Foundation.

OUTPUTS

Research

CSREES and partner sponsored research in community institutions, health, and social services promoted the advancement of knowledge through a variety of research projects. For example:

Kansas State Research and Extension Community Health Institute conducts community-based health behavior research that strives to understand and promote healthy behavior through innovative and sustainable partnerships and capacity building, behavioral science prevention and intervention research, and outcomes-based cooperative extension programming. CSREES through the Children, Youth, and Families at Risk program is funding a project entitled Teen Leadership for Physically Active Lifestyles. The Institute leveraged funds from a number of sources including the National Institutes of Health.

Extension

Through CSREES, extension work in the area of community institutions, health, and social services was accomplished through collaborative activities, curricula, publications, and other outreach resources during the FY 2000 through FY 2004 period. For example:

Oklahoma State University has used Smith-Lever 3(b) & (c) funding to leverage funds from the Federal Office of Rural Health for Rural Health Works (RHW) to demonstrate the economic impact of the health sector. RHW found that as much as 20% of the economic base of a community/county comes from the health sector. Not only does that much economic value greatly impact the sustainability of the community, but has been found to be related to community livability which influences population growth and vitality. RHW has grown from a pilot with 5 states to a national initiative with over 35 states.

Education

Higher education efforts in community institutions, health, and social services supported partnerships to enhance community knowledge and/or the educational experiences of students in a variety of areas. For example:

- To improve community health through better nutrition education for Native populations, a partnership between South Dakota State University and Sisseton Wahpeton Community College paved the way for a healthier diet for the Sisseton-Wahpeton Dakota people. A 2-year project, funded in part by a CSREES grant documented the diet of the residents of the Lake Traverse Reservation; conducted laboratory analysis of these foods at South Dakota State University to determine nutritional values; and provided information through an educational partnership that allows the people of the Lake Traverse Reservation to improve community health through better nutrition education and informed eating choices.

The project has documented that traditional Native American foods still eaten today are not prepared in the traditional methods and that traditional food preparation techniques have been lost in many tribal families. As a result of this partnership, the tribal community will gain a better understanding of nutrition, and will be able to incorporate traditional foods and food preparation techniques in their diets. Student at SWCC are gaining research experience in laboratory techniques, and SDSU students will gain a better understanding of the Native American culture, traditions and values.

OUTCOMES

Short-Term

- Increased knowledge and interest in collaboration among agencies with complimentary missions related to the health of rural communities
- Increased availability of resources (staff, knowledge, equipment and facilities, and services)

Medium-Term

- Increased connectedness and engagement among agencies in community-level service delivery
- Increased ability to assess community needs
- Improved communication leading to more consistent and reliable information delivered to communities
- Better understanding of policy and legislative issues
- Increased use of programs at the community level
- Improved ability to evaluate programs

- Increased professional development opportunities
- Adoption of healthier lifestyles

Long-Term

- Reduced health care costs
- Improved social, mental and physical health
- Reduced chronic and acute diseases
- Reduced stress
- More resources for preventative care, care of the uninsured
- Reduced expenditures on preventative disease

DISCUSSION OF SPECIFIC EXAMPLES

Case 1 – Rural Community Well-Being and Environmental Health

Through a Hatch funded project, Idaho is addressing the need for increased attention toward social well-being, collective identity, and the relationships between a community's resources and its people to: (1) identify key attributes in rural community settings that may lead to negative individual and/or collective responses to technologies perceived to threaten environmental and/or human health; and (2) develop measures of positive and negative impacts of rural development related to the interface between technology and the natural environment.

The Panhandle in northern Idaho has experienced significant residential in-migration which has largely concentrated in Kootenai, Bonner, Latah, and Nez Perce counties. At the same time the in-migration has occurred, heightened controversy over the issue of burning residue from the bluegrass seed production has resulted in intensive media coverage as well as litigation against the farmers by community-based special interest groups.

Short-term - Data suggested that the northern region had higher levels of perception of risk to humans related to the smoke, than is found in the more southern parts of the study region. Inversely, higher levels of perceived risk for environmental consequences related to water quality, soil erosion, and impacts from greater use of chemicals were found to be more prevalent in the southern part of the growing region. It was also found that there was a greater perception of the potential and perceived loss of farmland and open space with respect to whether a loss of the right to burn for farm operations would result in an increase in development of farm- or rangeland, the areas of highest residential growth indicated.

Medium-term - Findings would lead to public clarification of the historical and cultural contexts of Indian nations in the Intermountain West when dealing with government agencies and/or commercial enterprises needing to store/dispose/treat radioactive waste materials

Long-term - A loss of the right to burn for farm operations would result in a potential increase in development of farm or rangeland. Impacts to the social well-being of surrounding communities

have become more complex in relation to the changing economy of the region toward less resource production and more service-oriented and tourism-based sectors. These impacts are currently under further study by the College of Agricultural and Life Sciences at the University of Idaho.

Case 2 – Community Health Practices

In this Hatch funded project, researchers from the University of Minnesota worked with immigrant communities to identify indigenous health care practices and present these to health care professionals with the aim of improving the satisfaction of both groups in terms of their interactions. The project focused on diabetes and presented community views to professionals to develop a model for nationwide use. It brings immigrant community members (mainly Hispanic) together to discuss and validate their indigenous health practices and develop ways to communicate these to the mainstream medical community. During the FY 2000-FY2004 timeframe, the project resulted in the following:

Short-term - UMN conducted a community based participatory program on community health promotion for low literacy Hispanics and assessed needs through stakeholder input.

Medium-term - UMN developed materials on health care from the expressed needs of the stakeholder group; collected data from agencies that provide services to Spanish speakers; and conducted a pilot study on usefulness of materials.

Long-term - Provide health information to low literacy Spanish speakers in northeast Minneapolis and compare methods of nutrition and diabetes education for the maximum benefit to this audience.

Case 3 - Providing Essential Rural Infrastructure with Emphasis on Health

This Hatch funded project from Oklahoma State University developed economic tools and incorporated them into educational materials and technical assistance programs for rural decision-makers as they made decisions relative to structural changes in their community delivery systems in health care, solid waste, and emergency medical services. The project developed budgets of primary care health services that enable decision-makers to design a financially sound system meeting needs of their population; researched the importance of the health sector on a rural economy; measured the impact of critical access hospitals on health delivery and the community's economy; investigated rural collection systems which address illegal dumping problems; helped decision-makers evaluate costs of alternative delivery systems; and studied alternative systems to determine if they are cost efficient and medically effective.

Short-term - Research developed health budgets and applied the health impact model to new applications. A budget study was completed for rural health clinics and under development are studies for specialty physicians, rural dental practice, and CT scan.

Medium-term - Data and information are used by rural leaders as they consider the economic feasibility of primary health care services to determine what health service they can provide within their financial constraints.

Long-term - As telemedicine is introduced, new services may become feasible and decision-makers will need cost data on these alternatives. Under development are an impact of a new hospital on a community, and the impact of a federally qualified health center on a community. Impact analysis demonstrates the importance of the health services to a rural community.

Case 4 – Louisiana Rural Development Center

Research support of a Louisiana Rural Development Center to access and address needs of rural communities across Louisiana to improve quality of life of persons in rural communities through identifying the needs of rural communities, working with rural communities to find and secure necessary resources, ensuring that rural communities have access to databases and other information resources that can be applied to solve rural development problems, developing continuing education activities to increase communication between local communities and the center, and contribute to improving community leadership.

Short-term - Results of the study show that the Center for Rural Development at Louisiana Tech University has been involved in numerous activities that have increased access to resources for rural communities, thereby affecting the quality of life of persons in rural communities.

Medium-term - Assisted school systems in securing grant funds for installation to offer alternative teacher certification courses and other education courses to teachers across northern Louisiana. The Center hosted Rural Resource Development Conferences bringing financial and service resources agencies and rural community leaders (150+) together to share funding opportunities and other available assistance.

Long-term - Louisiana Tech faculty provides assessment and in-service training to rural school system personnel to improve student performance.

SUCCESS STORIES

The Tribal Colleges

Through USDA's support, many tribal colleges have made substantial contributions to the advancement of health education and collaborations around issues impacting their communities. For example,

According to the 2000 Census, the annual per capita income on the Northern Cheyenne Reservation is just \$7,736. Unemployment is almost 20%, and more than 28% of residents live below the poverty level. Nearly one-quarter of reservation households lack basic telephone services. Chief Dull Knife College (CDKC) Extension and USDA are providing outreach programs in community resource development that emphasize economic viability. CDKC

Extension strengthened tribal enterprises, developed tourism opportunities, and attracted new businesses and entrepreneurs. CDKC Extension helped create a community development corporation (CDC) that represents reservation districts, local businesses, and community groups. Participants evaluate tribal enterprises, and developing strategic economic plans for the reservation. CDKC provided workshops in e-commerce, financial literacy, and youth entrepreneurship.

In North Dakota, the number of Native American children who are overweight continues to rise, which increases their risk for Type 2 diabetes. United Tribes Technical College (UTTC) and USDA are promoting the historical and cultural relationship between Native peoples and the bison to emphasize proper nutrition, diet, and physical activity. Workshops are delivered to community members, college students, and young children. Last year UTTC Extension visited more than 150 elementary school children with nutrition education resource kits and healthy snacks. Nursing students, food service providers, daycare workers, and community members received nutrition education through courses, workshops, newsletters, and in-service training.

Prevention Education

Effective prevention education practices help decrease risky behaviors and the subsequent difficulties people experience in their communities. Collaborative support to enhance the effectiveness of health promotion at the community level is evidenced through local, state, and federal partnerships. At the federal level, broad collaborative support for health promotion provides the basis for improving health outcomes for communities. CSREES and its partners at the national level provide information and education on a variety of health-related issues, connecting people to community resources that promote health and wellness. Programmatic examples of prevention education include:

National Poison Prevention Council

Approximately 30 children die every year due to accidental poisonings, and approximately 1 million phone calls are placed to Poison Control Centers annually by adults seeking help. National Poison Prevention Week was established by the U.S. Congress in 1961 as a focal point for 37 organizational members' activities, coordinating plans and avoiding duplication of efforts. Membership on the Council is limited to national organizations with an interest in and commitment to programs aimed at preventing unintentional poisonings. CSREES council member organizations distributed over 30,000 packets of poison prevention materials, 80,000 posters, and reached 45 million nationally with video news releases which broadcast quality shots of a local poison center in action, shots of a family interacting with children, footage from the news conferences and sound bites.

Federal Interagency Task Force on Older American Indians

The Federal Interagency Task Force on Older Indians represents departments and agencies with an interest in older Indians and their welfare. Charged by the Administration on Aging Director, Office for American Indian, Alaskan Native and Native Hawaiian Programs to: share information and resources to improve coordination of programs and services for older Indians; increase access to and availability of programs and services for older Indians; simplify and

streamline community systems for delivering programs and services to older Indians; and assist Tribes as they plan, implement, and administer programs and services for the benefit of older Indians. The Resource Committee maintains a database of federal grants and programs that Tribes can explore as they look at funding for services for the elderly. The Data Committee examines national data about Indian elders particularly in the areas of health indicators, transportation, labor and employment issues as well as elder abuse. The committees developed publications for tribal use related to these issues and distributed information at the National Title VI Technical Conference for the 550 federally recognized Tribes represented at the meeting in Washington, D.C.

National Disaster Education Coalition

Preparing to avert disaster costs less than repairing the damage it has done. The US Geological Survey calculated that economic losses worldwide from natural disasters in the 1990s could have been reduced by \$280 billion if just one seventh of that amount had been invested in disaster preparedness. The National Disaster Education Coalition (NDEC) is composed of over 20 federal government agencies and national not-for-profit organizations that work together to develop and disseminate consistent educational information for the public about disaster preparedness to formulate information and advise the public to prepare and respond to natural and human-caused disasters. NDEC agencies ensure that disaster safety messages are appropriate, accurate, research-based, and crafted appropriately for the audience by using understandable language.

Through this collaboration, the "**Talking about Disaster: Guide for Standard Messages**" was developed in 2004 and disseminated nationwide. The guide includes information on children's issues, Chemical Emergencies at Home, Disaster Supplies Kits, Drought, Earthquakes, Evacuation and Sheltering, and Post-disaster Safety, Family Disaster Plans, Fires, Floods and Flash Floods, Hazardous Materials Incidents, Heat (Heat Wave), Hurricanes and Tropical Storms, Landslides, Nuclear Power Plant Incidents, Terrorism, Thunderstorms, Tornadoes, Tsunamis, Volcanoes, and Winter Storms. A web-based version was accessed over 315,000 times in 2004.

TEAM UP

TEAM UP is a national partnership begun in 2002 to increase cancer screening among rarely/never screened individuals. National partners include CSREES and the Centers for Disease Control and Prevention, National Cancer Institute, and the American Cancer Society. TEAM UP is focusing efforts to increase breast and cervical screening rates in eight high-mortality states: Alabama, Georgia, Illinois, Kentucky, Mississippi, Missouri, South Carolina, and Tennessee. State teams developed plans and are identifying evidenced-based interventions they can implement to increase cancer screening rates.

Medicare Education Project

CSREES developed a strong partnership with the Centers for Medicare and Medicaid Services of HHS in 1999. A pilot program, Teens Teach Internet Skills was the first outreach program developed jointly. Teens in 4-H were trained to help seniors and their family members access

information through the Medicare.gov web site. The evaluation showed that teens are successful in teaching seniors to make informed health care choices. A Medicare Toolkit that provides background for Extension Educators who work with seniors and caregivers has been distributed widely and training at the University of Wisconsin who served as project directors for this effort. The materials help clientele understand Medicare benefits.

The Centers for Medicare and Medicaid Services recognizes CSREES and the Cooperative Extension System as valuable resources with an outreach infrastructure like no other. CMS came to CSREES when the new prescription drug card benefit was approved by Congress and asked for assistance in reaching seniors and their caregivers. President Bush asked his entire Cabinet to involve their Departments in a nationwide effort to promote Part D.

CSREES is working with the Centers for Medicare and Medicaid to help Medicare beneficiaries make informed decisions about the Medicare Prescription Drug Card Program. Extension offices, partner universities, and community organizations in South Dakota, Idaho, Nevada, Wyoming, and Nebraska have developed outreach and marketing programs for seniors. To date, the University of Nebraska-Lincoln reports that they have reached over 199,000 people through a variety of media efforts in the state, and enrolled more than 530 Medicare beneficiaries in the program at an estimated savings of \$820,320. More than 430 received individual assistance with the enrollment process, more than 200 civic groups and organizations were contacted about the program, and approximately 840 people requested worksheets and used them to enroll themselves or others.

The University of Idaho reports that they have reached over 400,000 through their educational campaign and enrolled over 400 people in the program. The project, began in 2004, continues with changes to Part D of Medicare and CMS is seeking the assistance of Cooperative Extension to educate beneficiaries and potential beneficiaries about the changes. Through research and education CSREES can influence the health literacy of individuals, families, and communities and help the US achieve health goals.

Immunization Education

Promotion of immunizations across the lifespan by providing information, resources, and programs about immunizations and vaccine preventable diseases was enhanced by a coordinated national effort by Cooperative Extension. Often this is linked to parenting education programs provided by Cooperative Extension as well as health education. Immunizations for youth children through adolescence is often the focus of immunization education programs and requires parents and caregivers to follow immunization schedules to meet requirements for school admission. Campaigns have been completed to increase the number of seniors receiving flu vaccines. University of Tennessee Extension Service and the College of Pharmacy worked with pharmacists to motivate local citizens to obtain flu vaccine.

Extension Pharmacy Alliance

The Extension/Pharmacy Alliance for Community Health began as a special project of the national initiative, Healthy People...Healthy Communities modeled after the successful

partnership between University of Tennessee College of Pharmacy and Extension Service. Many universities met to share educational programs, curriculum, materials and ideas between Alliance members; document and disseminate program results; and develop multi-state programs. University of Tennessee, Ohio State University, and the University of Kentucky collaborations resulted in joint programming, joint faculty appointments, joint funding, and expanded outreach. Examples included immunization education, poison prevention education, medication management, diabetes education, and learning to work with health care providers.

Bridge for Adolescent Pregnancy, Parenting, and Sexuality (BAPPS)

BAPPS provides research-based resources to advance the knowledge and practice in the areas of adolescent pregnancy, parenting and sexuality. BAPPS bridges professionals working with youth, families, and communities on APPS issues and marshalling the human, program and research resources of the land-grant universities and their collaborators. Adolescent pregnancy, parenting, and sexuality are issues that impact teenagers, their children, their parents and their communities. Extension uses its interdisciplinary Children, Youth and Family networks to provide leadership to marshal resources to build resiliency in children, youth and families as they address the issues of adolescent sexuality, adolescent pregnancy and adolescent parenting.

Rural Health Works

Rural Health Works helps communities keep their health care dollars at home. Twenty states used Rural Health Works to decide to participate in the Critical Access Hospital program, which gives hospitals a major reimbursement advantage.

The University of Tennessee Center for Community-Based Health Initiatives

University of Tennessee Center for Community-Based Health Initiatives represents a partnership between two units of the University: College of Pharmacy and the Extension Service to create, deliver, and evaluate innovative health education programs to result in self-responsibility for health. The Center has four program priorities: adult immunizations, poison prevention education, medication awareness education, and health literacy addressing acute and chronic diseases. Within these four areas the Center has created program partnerships with organizations at the county, state and national levels; developed and implemented educational campaigns and programs; identified, developed and disseminated educational tools and resources for use by county Extension educators and community pharmacists; measured and reported program outcomes and impacts; obtained funding to assist the Center in achieving program objectives; established a telehealth communication network among members of the Center utilizing web-based methods and video conferencing; and conducted professional developmental training of county Extension educators and community pharmacists utilizing expertise from the faculty with the College of Pharmacy, Drug Information Center, Extension Service, and the Poison Control Center.

Bone Builders

Bone Builders brings osteoporosis prevention to Phoenix/Maricopa County area to reduce the risk of osteoporosis for women ages 25-55 in Maricopa County and women 15 and older statewide. The two short-term goals are to increase awareness of the risks and ways to prevent

osteoporosis, and to increase prevention (screening, diet and exercise) behaviors in women ages 25-55. Bone Builders began as a partnership between the University of Arizona Cooperative Extension and the College of Public Health, along with nine partner organizations to plan, develop and implement the program. Bone Builders uses social marketing to promote healthy bone behaviors through its website, posters, public service announcements, articles, and outreach efforts. There are 14 learning activities that trained volunteers use to educate the community, topics including Bone Builder Jeopardy, Calcium Labels Kit, Supplement Comparison, a slide set, and Bone Builder Bingo. Handouts on exercise, high calcium recipes, calcium calculator, and risk assessment are also available. Several of these have been translated into Spanish.

Partners in Wellness

Older adults are the fastest growing population across the nation. Food security and dietary quality are problems for this population. Partners in Wellness Program lower participants' risks for malnutrition. It applies a holistic approach of multi-level, highly interactive nutrition delivery methods for changing behaviors. This program has been found to be very effective and is being implemented across North Carolina and in other states. The entire curriculum consists of 11 modules addressing risk factors for malnutrition within the adult population. The participants develop a personalized plan to improve their nutritional status based on what they learn.

There were 1348 participants in the Partners-In-Wellness program in 2001. It significantly impacted the behavior of older adults and lowered their risk for malnutrition, which no other program has been shown to do

NEW DIRECTIONS

Areas of future work include but are not limited to:

- Assessment of educational programs that promote behavior and lifestyle changes
- Determining what factors influence healthy lifestyles
- Development of standards and recommendations that help people achieve healthy lifestyles
- Broader dissemination of information on healthy lifestyles for professionals, students, and the public.

The land-grant system is essential to the future health literacy of the US population. The vast research and educational capacity of land-grant universities that includes the health, agricultural, and human sciences should focus on increasing health literacy, health status, and reducing health disparities. The land-grant system is especially important in rural and medically underserved areas of the country where the Extension Service may be the only agency providing health education. The 1890/1994 land-grant institutions and the Hispanic Serving Institutions have unique roles to play if health disparities are to be eliminated.

CSREES has demonstrated the interconnectedness of health issues with the agricultural and human sciences and has successful programs that add value to those of the medical community. Therefore, CSREES must provide national leadership and initiate partnerships with Federal and state agencies, national professional societies, and non-governmental organizations to maximize resources and linkages that promote health literacy. These bridges of collaboration should lead to improved program effectiveness and create opportunities for innovative research and program development.

The new **Medicare Part D Prescription Drug Benefit** available to 40 million Americans provides a classic example of the need for enhancing health literacy and the role the Extension System can plan in health education. Most beneficiaries are not health literate or computer literate. Enrollments for this program are managed on-line.

The **Medicare Education Program** is also allowing Extension to reach out to new audiences. For example, Nebraska Extension is piloting efforts to target eligible Hispanic and Native American Medicare audiences in Northeast Nebraska.

Another rapidly expanding area for programming is physical activity promotion. Walking is the most regularly practiced mode of physical activity (PA) for many Americans. It is a simple, safe and effective way to meet current guidance to engage in moderate intensity activity for at least 30 minutes for adults and at least 60 minutes for children and adolescents on most days of the week.

A number of walking programs have been developed by Extension in an effort to help people establish the habit of physical activity. However, the prevalence of these walking programs varies and is dependent on institutional support, funding and professional staff expertise. For those institutions with a successful walking program, the format is similar with a team approach for support and encouragement over an 8 to 12 week period. Usually, the goal is to “walk, step, or move” across the state. Participants frequently have the opportunity to attend classes and receive information on both nutrition and physical fitness. Usually programs are devised for adults, but comparable youth programs are emerging. Lack of dedicated funding and qualified professionals were named as reasons where Extension walking programs do not exist. Also, the lack of tools to assess and measure walking behavior, established research protocols and acceptable evaluation techniques were identified as challenges in support of on-going walking programs.

Walk Across Texas is the most notable and one of the first of its kind to be developed. The program consists of teams of eight family members, co-workers or friends who walk together or individually over the 8 weeks. Since 1996, more than 85,000 Texans have participated to significantly increase their physical activity level. In 2003, 11,627 people participated in Walk Across Texas! 1,977 males and 9,650 females.

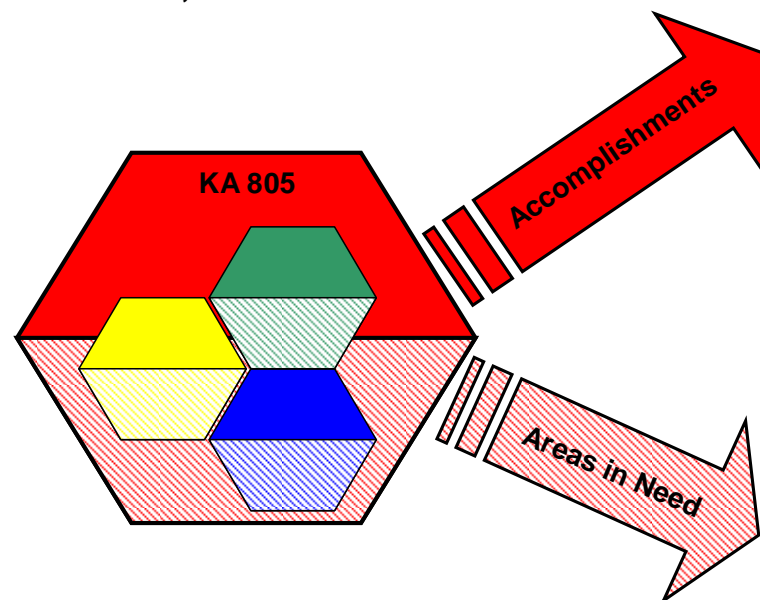
With funding and qualified professionals these programs could extend to all land-grant institutions. Physical activity programs are now available through Extension in 13 states but this

number could be increased. A partnership with **CDC's STEPS** program is being promoted by CSREES national program staff.




Special niche future health programs will build upon the campus and interagency collaborations that are well established. Land-grant university research and Extension programs are logical partners with the departments and colleges for the health professions and provide "real world" linkages for discovery and engagement. A broad array of health promotion and education efforts will increase health literacy for more Americans. The interrelatedness of health and the agricultural sciences is clear but requires more CSREES leadership activity. The economic and community viability impacts of such efforts reinforce the wisdom of such investments.




Figure 28 – KA 805 Honeycomb




Knowledge Area 805: Community Institutions, Health and Human Services



KA 805 - Major Themes

-  Effective Use of Health Care System
-  Health Literacy
-  Reduced Health Care Costs

- 
 - Increased collaboration among agencies with complimentary missions related to the health of rural communities
 - Increased connectedness among agencies in community-level service delivery
 - Increased consistency, effectiveness, and efficiency of community level interventions without duplicated efforts
- 
 - More consistent and reliable information delivered to communities
 - Better understanding of policies and legislative issues
- 
 - Increased efficiency in stewarding limited resources

- 
 - Assess the healthfulness of lifestyles and analytical methods
 - Develop and evaluate educational programs and strategies on healthy lifestyles and the dissemination of related information for professionals, students, and the public.
- 
 - Identify factors that influence the healthfulness of lifestyles
 - Develop more standards and guidance on healthy lifestyles
- 
 - Add to the development of the National Health Materials Database for easier access to resources

Knowledge Area 806: 4-H Youth Development

OVERVIEW

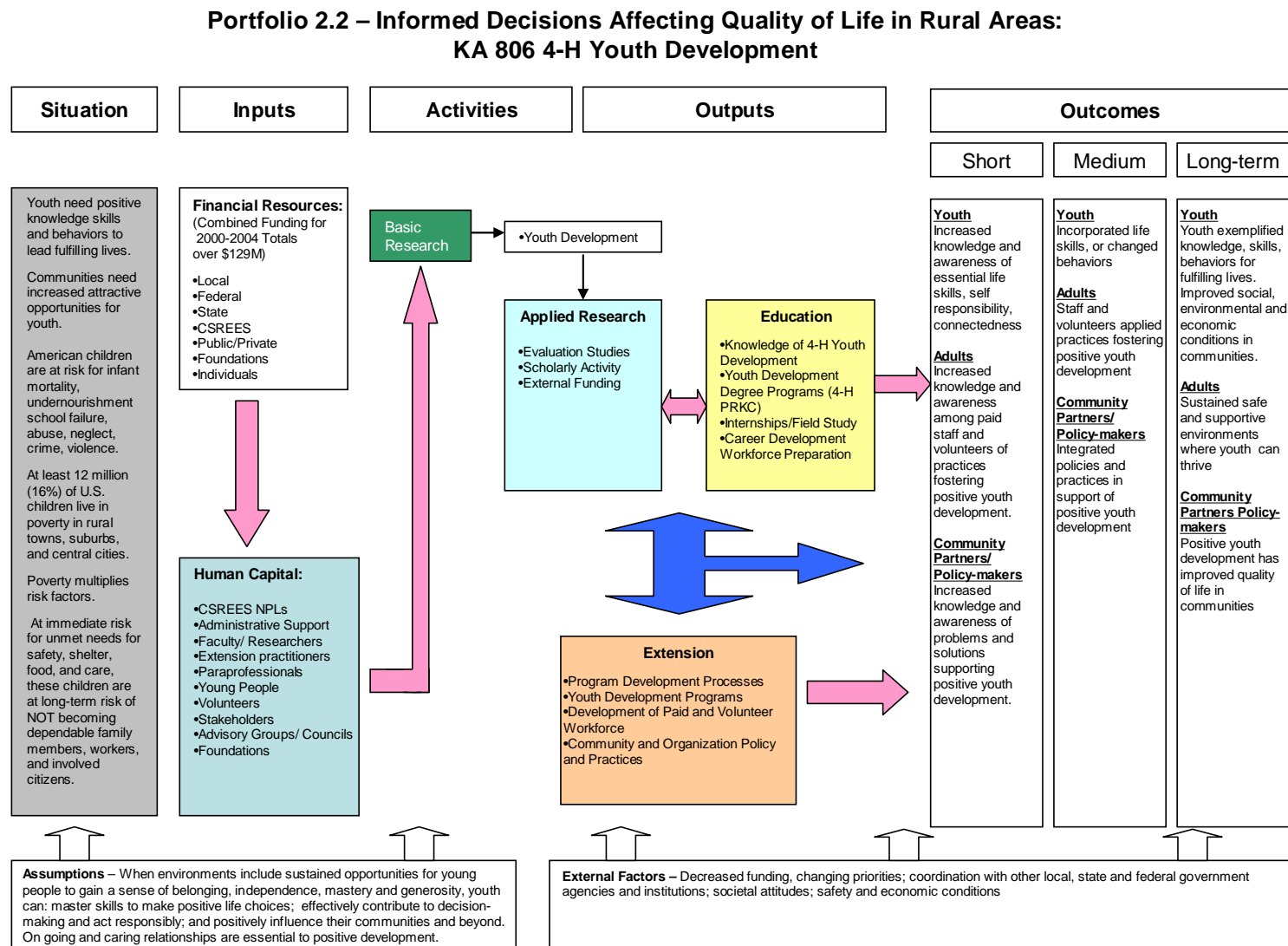
Knowledge Area 806, 4-H and Youth Development, addresses program development for youth, and the preparation and engagement of young people. Youth development is the natural process of developing one's capacities. While it occurs through youth's daily experiences with people, places and possibilities, it is far too important to be left to chance" (National 4-H Leadership Trust, 2002). This knowledge area is at a watershed point in its development, as a result of a number of converging forces, including expansion of the program to include more participants in new program areas, the need to integrate research, education, and extension work (and recognize research streams outside CSREES), and the increasing professionalism of youth workers. The new Knowledge Area 806 complements and is integrated with a number of KAs in the CSREES strategic plan, including KA 802, Human Development and Family Well-Being.

The 4-H program model, with over a 100 year history, has been adapted to new initiatives, including: partnerships with defense agencies to support children in military families (Army, Air Force, and other service branches); efforts to strengthen states' ability to address high risk youth (CYFAR); and programs to support rural children, youth, and families (RYD). The new initiatives continue to emphasize community youth development programs, designed to provide beneficial, positive, and encouraging relationships with adults and peers, sustain them over time, and give youth opportunities to build their skills and become engaged as partners in their own development and their communities' development.

4-H programs address diverse populations through a large and complex system. The 4-H program combines the cooperative efforts of nearly 7 million youth; the National 4-H Headquarters in the Cooperative State Research, Education and Extension Service (CSREES) of the US Department of Agriculture; volunteer leaders and professional staff; 105 state land-grant universities; state and local governments; private-sector partners; state and local 4-H foundations; and the National 4-H Council. 4-H programs are conducted in the United States, Puerto Rico, Virgin Islands, Guam, American Samoa, Micronesia, and Northern Mariana Islands. 4-H-type programs are also international, with youth in more than 80 countries in similar, independent programs.

Those working in youth development face particular challenges to improve program development, implementation, and evaluation of 4-H programs.

Figure 29 – KA 806 Logic Model



SITUATION

4-H youth development programs began over a hundred years ago with local “corn clubs” in which extension agents worked with rural youth to introduce new varieties of corn as a means of persuading elders to adopt new technologies. Over time, these clubs became organized youth programs, expanded to teaching youth more skills in agriculture, and then expanded to youth development more broadly.

In a parallel development, researchers, youth workers, and policy makers realized that it was both short-sighted and expensive to focus national attention and resources too narrowly, with interventions directed to “target populations” of troubled youth with deep-seated problems. More attention began to be paid to what factors seemed to make some youth resilient and able to overcome adversity, and ways in which problems among youth could be prevented at earlier ages (and at lower cost). Public concern and policy concerning youth also have shifted from public investments in programs targeting specific problems and threats to young people (teen smoking, sexually transmitted diseases, unintended pregnancy, alcohol and other drug use, juvenile delinquency and youth crime) to a broader, more holistic view of helping youth to realize their full potential. (National Research Council and Institute of Medicine, *Community Programs to Promote Youth Development*, 2002)

As attention was being paid to the divide between youth who were thriving and doing well, and those who were not, increased attention was paid to emerging gaps among the youth. Public policy toward youth turned to efforts to ensure that all children and youths have greater opportunities to reach their potential, and that our systems track all our youth – not only our best-achieving youth, our most distressed youth.

A significant proportion of American children are at substantial risk for negative outcomes -- abuse, neglect, poor health, substance abuse, teenage pregnancy, violence. In 2003, 18 percent of all children ages 0-17 lived in poverty³. Poverty exacerbates other risk factors, and is the central reason many children and families do not thrive. These children and youth need to be in environments where they have opportunities to acquire the basic skills they need to become responsible family members, participants in the work force and contributing citizens.

Children with parents in the military face many challenges as their parents move frequently and are deployed for long periods and to dangerous locations. Other children and adults often do not understand military culture and the impacts of deployments, separations, or reunions on these youth and their families. Youth in military families need help in connecting with other youth, caring adults, and community programs and services which are sensitive to their specific situations and needs as their parents serve the country.

³ Federal Interagency Forum on Child and Family Statistics (2005). *Children: Key National Indicators of Well-Being*, 2005. [On-line]. Available at: www.ChildStats.gov

Some rural youth experience less community interconnection of people due to long commute times; are impacted by diverse populations; experience geographic isolation; have fewer physical locations in which to interact with peers and adults; have limited programs and opportunities; limited employment opportunities; and have less access to technology at home when compared to their urban and suburban counterparts. In contrast, rural youth often have a greater opportunity to assume leadership roles when their communities are viable.

ASSUMPTIONS

Effective youth development programs are based on basic and applied research. Developing programs for youth that will produce positive outcomes requires appropriate program design and planning, implementation, and evaluation. Programs also must be attractive to youth, so that they will voluntarily participate.

Positive relationships with a caring adult, a safe environment, opportunities for youth to develop mastery (building of knowledge, skills, and positive attitudes), and the ability to demonstrate their new skills in public service are essential elements of effective programming for youth. Research indicates that youth development programs addressing these components are more likely to result in healthy and happy children, who demonstrate a sense of maturity and civic engagement as adults and become stronger individuals, creating stronger families and better communities.

EXTERNAL FACTORS

Significant external factors impact the scope of youth development efforts by research, education and extension staff. Economic, demographic, and sociocultural factors may help or hinder youth development programs. Risks include high rates of poverty that negatively impact the physical and intellectual development of children and youth; disruption of relationships due to divorce, job loss, military deployment and other social factors; increased mobility that separates extended families or neighborhood networks; increased reliance on television and computers as babysitters or companions; age segregation, particularly large concentrations of youth with limited adult contact; and the reduced number of positions with adequate pay and benefits available to unskilled youth. Even as risks remain, knowledge about and expectations of youth have increased. Awareness of the needs of youth for safety and protection, increased food and health literacy to address the long-term health and well-being of young people, and new developments in science and technology (leading to a greater need for young people to have basic science skills and the ability to solve problems with scientific applications) lead to raised expectations of programs addressing youth development – and of youth.

The federal budget deficit, reductions in giving by foundations (adversely impacting social investments and investment in children, youth, and families), and a lack of adequate public policies to address the condition of children and youth also affect youth development.

INPUTS

Table 22: Research, Education, and Extension Funding for KA 806, 4-H Youth Development, CSREES Sources

Funding Source	Fiscal Year (in thousands)					Grand Total
	2000	2001	2002	2003	2004	
Hatch	\$ 385	\$ 396	\$ 399	\$ 422	\$ 371	\$ 1,973
McIntire-Stennis	\$ 1	\$ 2	\$ 4	\$ -	\$ -	\$ 7
Evans Allen	\$ 98	\$ 98	\$ 114	\$ 164	\$ 168	\$ 642
CSREES/CYFAR	\$ 9,000	\$ 8,481	\$ 8,481	\$ 8,426	\$ 7,538	\$ 41,926
CSREES/RYP	\$ -	\$ -	\$ 8,000	\$ 2,981	\$ 2,667	\$ 13,648
Other CSREES	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total CSREES	\$ 9,484	\$ 8,977	\$ 16,997	\$ 11,993	\$ 10,744	\$ 58,196

KAs 802 and KA806 were originally combined. As the growth of work in KA802 necessitated the creation of the new KA806, the funding for KA802 and KA806 was divided to correspond to the alignment of projects. In Table 22 and in Table 14, CSREES funds initially aligned with KA802 from formula funding lines (Hatch, McIntire-Stennis, Evans Allen, and Special Grants) have been divided between KA802 (65 percent of the initial amounts) and KA806 (35 percent). NRI and SBIR funding lines are competitively awarded and thus were not re-allocated.

Table 23: Research, Education, and Extension Funding for KA 806, 4-H Youth Development, All Sources

Funding Source	Fiscal Year (in thousands)					Grand Total
	2000	2001	2002	2003	2004	
CSREES	\$ 9,484	\$ 8,977	\$ 16,997	\$ 11,993	\$ 10,744	\$ 58,196
Other USDA	\$ 34	\$ 51	\$ 104	\$ 62	\$ 7	\$ 258
Other Federal (Military):	\$ 3	\$ 3	\$ 4	\$ 6	\$ 8	\$ 23
4-H/Army	\$ 2	\$ 2	\$ 3	\$ 5	\$ 6	\$ 18
4-H/Air Force	\$ 1	\$ 1	\$ 1	\$ 1	\$ 2	\$ 5
State Appropriations	\$ 1,793	\$ 1,881	\$ 2,150	\$ 2,235	\$ 2,434	\$ 10,493
Self Generated:	\$ 874	\$ 13,790	\$ 15,402	\$ 14,685	\$ 14,239	\$ 58,990
National-4-H Council		\$ 13,702	\$ 15,286	\$ 14,573	\$ 14,170	\$ 57,730
Other Non-Federal	\$ 310	\$ 277	\$ 207	\$ 206	\$ 170	\$ 1,170
Total KA 802	\$ 12,498	\$ 24,978	\$ 34,865	\$ 29,187	\$ 27,602	\$ 129,130
CSREES as % of Total	75.9%	35.9%	48.8%	41.1%	38.9%	45.1%

In Table 23 and in Table 15, some CSREES funding lines initially aligned with KA802 were re-allocated to KA802 (65 percent of the initial amounts) and KA806 (35 percent). The exceptions are “Other Federal Funding”, referring to specific funding for military programs and projects,

and the self-generated funds. Both KA802 and KA806 had unduplicated direct military funding for programs and projects of each KA. The initial self-generated funds aligned with KA802 were split (KA802, 65%, KA806, 35%). However, KA806 also had self-generated funds from the 4-H Council.

CYFAR grants (Table 22) totaling \$42 million from 2000-2004 have been matched with approximately \$11 million in state and local funding, and have contributed to the leveraging of substantial additional resources for youth programs from other Federal agencies. The \$11 million is based on the required 100% match on the state portion of CYFAR grants over 5 years.

Partnerships continue to support 4-H programs on Army and Air Force bases across the United States and in Europe, Korea, and Japan (Table 23). Approximately \$2 million has been spent on special support programs for children of National Guard and Army Reserve because of the war on terrorism.

4-H Youth Development is also critically dependent upon public-private partnerships, a model that has helped to sustain it over the years. National 4-H Council (Table 23), in partnership with National 4-H Headquarters, CSREES, is pivotal to advancing the outcomes for 4-H youth development. During 2002 – 2004, National 4-H Council distributed over \$57 million throughout the 4-H system for program development and enhancements. National 4-H Council supports educational programming around the same priorities. State 4-H foundations also provide funding for educational programs and activities at varying amounts.

MAJOR THEMES

Through the programs described below, children, youth, and families take part in efforts to improve human, social, civic, cultural, natural and financial capitals, and thereby contribute to increasing economic opportunities and improved quality of life in rural areas.

The 4-H Youth Development program (Smith-Lever Formula 3 (b) & (c)) is the flagship youth development program of the U.S. Department of Agriculture. “4-H empowers youth to reach their full potential working and learning in partnership with caring adults.” Through 4-H programs, youth are linked to Land-grant universities’ research, extension, and educational programs. Youth development educators, adult volunteers and Extension faculty provide leadership for the assessment, design, implementation and evaluation of programs in their communities. During 2001 – 2005, 4-H reached 34.6 million young people, with the support and commitment of 2.9 million adult volunteers across the United States.

Children, Youth and Families at Risk (CYFAR) (Smith-Lever 3d). In 1991, USDA-CSREES began funding the Children, Youth, and Families at Risk National Initiative (CYFAR). The initiative emphasizes a holistic approach to preventive programs that address risk and resilience factors in children, youth, families, and communities. The CYFAR vision is of American families and communities in which children and youth lead positive, secure, and

happy young lives while developing the skills, knowledge, and competencies necessary for fulfilling, contributing adult lives. The CYFAR mission is to integrate resources of the Land Grant University Cooperative Extension System to develop and deliver educational programs that equip limited resource families and youth who are at risk for not meeting basic human needs, to lead positive, productive, contributing lives. Community-based programs are developed with active citizen participation in all phases of programming, planning, implementation, and evaluation, to best meet the needs of their communities and increase the probability of being sustained (USDA, 1997).

While 1890 and 1994 institutions are *not* eligible to apply for CYFAR (3d) grants, 1862 institutions are encouraged to collaborate and sub-contract with them. In NC and Kansas supplementary funds have been added to the original CYFAR grants for collaborations with North Carolina A&T and Haskell Indian Nations University. University of Maryland collaborates with University of District of Columbia to support a CYFAR program in Washington DC and 1862 institutions in 10 states have collaborations with their 1890 and 1994 institutions.

- MO - Lincoln University
- AL - Tuskegee (Macon County)
- ND - Standing Rock Indian Reservation & Sitting Bull Tribal College
- AZ - Hardrock Reservation
- LA - Southern University
- MT - Rocky Boy Reservation
- NV - Duck Valley Indian Reservation
- TN - TN State University
- GA - Fort Valley State University
- OK - Cherokee Nation

4-H for Youth with Parents in the Military. Initiated with an Interagency Agreement in 1995, the partnership between the U.S. Army Community & Family Support Center (CFSC), the Air Force Family Member Programs and USDA, CSREES works to support their common concerns for positive youth development for children and youth. Support networks have also been created in communities for those children of National Guard and Army Reserve Soldiers who are not affiliated with bases and are impacted with war deployments. The USDA/military partnerships address multiple goals, including:

- Improving mission readiness -- members of the military can focus on their mission, knowing that their children are in safe, supervised environments with caring adults;
- Using tax dollars and resources effectively, by bringing together USDA's expertise in youth development with the Army's goal of developing model youth programs; and
- Serving youth not being served.

Rural Youth Development. In February, 2002, nearly 1200 youth and adults participated at the local, state, or national level in the **National Conversation on Youth Development**. Participants recognized that rural youth face economic and physical barriers to receiving adequate care, services, and resources necessary for healthy development. The conference report recommendations focused on increasing participation by rural youth in youth programs, enhancing opportunities for youth involvement in policy and decision-making; creating safe and inviting environments for youth activities; and improving access to information and technology. The Rural Youth Development Grant Program (Grants to Youth Serving Institutions) was authorized by Congress in 2002 for the purpose of expanding youth development programs carried out by the eligible organizations (Girl Scouts of the USA, the National FFA Organization, National 4-H Council, and the Boy Scouts of America) in rural areas or small towns. The stated purposes of the RYD program are to:

- Support programs which address needs of rural youth; and
- Involve those youth in design and implementation of their educational activities.

The broad outcomes of RYD program include:

- Rural children and youth with the knowledge, skills, attitudes and behaviors necessary to live productive, contributing, and fulfilling lives; and
- Rural communities that are strong, vibrant, and sustainable as environments for positive youth development.

OUTPUTS

The 4-H Youth Development program is supported by a long history of integrated education, extension, and research projects. Those described below, listed chronologically by the earliest dates events were held or organizations created, are the most relevant USDA-supported projects providing ongoing support for the 4-H Youth Development Program model.

Beginning in 1927, a **National 4-H Conference** has been held each year to engage youth in developing recommendations to strengthen and expand the 4-H Youth Development Program with recommendations to the Secretary of Agriculture. Programming centers around the citizenship mandate for 4-H and builds capacity for participants to be better equipped and more engaged in their communities.

In 2000, the **National 4-H Leadership Trust** was formed to enhance information exchange among all 4-H partners. During 2002-2004, the Trust identified and promoted action on the strategic plan and emerging issues across the 4-H system. To address: 1) the power of youth, 2) access, equity and opportunity, 3) an extraordinary place to learn, 4) exceptional people, innovative practices and 5) effective organizational systems. As a result of the plan, equity, access and opportunity for young people and learning opportunities for paid and volunteer staff have increased.

In 2001, 1,577 ‘Local Conversations’ on Youth Development were held across the United States. More than 10,000 specific action items were produced and then reviewed by participants at 63 State Conversations. In 2002, at a **National Conversation on Youth Development**, 200 youth and adults used networked wireless laptop computers and instant polling technology to develop specific national strategies and action steps, based on the Local and State conversations. Action steps to be taken include placing youth advocates with each federal department and agency, promoting diversity, expanding civic engagement, increasing training, support and incentives to attract and keep staff and volunteers, and improving coordination and collaboration.

In 2002, a **National Task Force** was formed to develop a national 4-H professional development system. In 2003, the **National Professional Development Task Force** conducted a study to update the professional **research and knowledge base for 4-H youth development**. See www.national4-hheadquarters.gov. In 2004, the **Wingspread Conference** on “Attracting, Developing and Retaining Youth Workers for the Next Generation” was held. The strategic plan developed addressed standards and competencies, training and professional development resources, learning delivery systems, career ladders and compensation and evaluation and research.

The **Great Plains Interactive Distance Education Alliance (Great Plains IDEA)** operates as a strategic alliance in which institutions work together to field graduate programs; manage institutional and shared resources in efficient ways; and enrich the teaching experience for faculty and the learning experience for students. Trained youth development professionals are critically needed, and few graduate programs focus solely on youth development. Great Plains IDEA is the only alliance of public universities to offer a graduate program or graduate certificate completely online in youth development. Other graduate degrees or certificates include community development, family financial planning, and certification in family and consumer sciences.

Additional outputs include products to aid in program development, capacity building, and evaluation, such as:

- **Assessing Outcomes in Child and Youth Programs (CRIS #0187162).** Sabatelli and Anderson developed a handbook to assist staff in child, youth, and family programs to assist in planning and conducting program evaluations. A second edition, *Assessing Outcomes in Child and Youth Programs: A Practical Handbook, Revised Edition, September 2005*, includes positive youth developmental outcomes and a completely updated selection of indicators, including measures and instruments for use with children between the ages of 7 and 11. See <http://www.opm.state.ct.us/pd1/grants/JJAC/JJACPublications.htm>.
- **CareerSmarts.** North Carolina State University Cooperative Extension Service 4-H and Youth Development, developed the *Parents, Youth and Careers* program, which assists parents with helping their children choose careers. The project produced several noteworthy deliverables: a data set focusing on adolescent career development; a book,

Helping Your Child Choose A Career; numerous journal articles and professional presentations on project research; three doctoral dissertations; and in-service training workshops and presentations in professional forums. This program and its prior version provided training for more than 5,000 counselors and youth workers nationwide. (CRIS #0183467)

Through **CYFAR**, over 65% of the originally funded CYFAR community programs have been sustained 6 years beyond CSREES funding. Extension Services report increased capacity and commitment to support community based programs for children, youth, and families at risk according to the Organizational Change Survey of 2005.⁴

Beginning in 1994, State Strengthening Projects were designed and funded to improve statewide capacity to support as well as improve the quality and quantity of community-based programs for children, youth, and families at-risk. The CYFAR initiative also has funded National Children, Youth, and Family Networks to provide technical assistance to communities and CYFERNet, an electronic information infrastructure linking the networks to assist communities with computer and technology issues. CYFAR programs have served about **50,000** youth ages pre-kindergarten to 19 and their parents each year in more than 300 communities.

4-H Military Partnerships. 4-H Clubs for youth with parents in the Air Force continue to grow on Air Force bases around the world. Each base is required to run three 4-H clubs with one of the clubs' focus in the area of Health, Nutrition and Fitness. The 4-H experience on each base includes a variety of club options that range from photography to embryology; gardening to animal care; sewing to woodworking; and GPS geo caching to robotics. Currently, there are more than 3,800 Air Force affiliated youth enrolled in 4-H. There are:

- 75 Air Force Bases collaborating with 4-H;
- 155 4-H clubs on Air Force bases;
- 346 Air Force staff trained by 4-H; and
- 3,824 youth enrolled in 4-H clubs on Air Force bases.

Every Army installation around the world and most Air Force bases have a 4-H program.

- **15,000** Army and Air Force youth are enrolled in military 4-H clubs.
- Staff from all Army and Air Force installations have been trained in "4-H 101," an introduction to the 4-H program.
- County 4-H professionals receive annual awards from Army and Air Force for their military work.
- 28 States have received 4-H Military Grants, funded by a three way partnership between National 4-H Headquarters, Army Child and Youth Services, and Air Force Family

⁴ CYFAR Sustainability Research and CYFAR Organizational Change Survey Data are available at: <http://www.cyfernet.org/>

Member Programs. Each of the federal partners contributes funding, shares responsibility for reviewing and approving grants and providing support to the resulting 4-H Army or 4-H Air Force programs, which are established in the states and counties.

As Army National Guard and Army Reserve Soldiers have increasingly been deployed overseas, State 4-H Military Liaisons stepped forward and worked with Army CYS and National 4-H Headquarters to develop a coordinated response to the special needs of “newly military” children and of Army National Guard and Army Reserve Soldiers. “Operation: Military Kids” (OMK) was created in a few months in response to these needs. The State 4-H Military Liaison serves as OMK project director and assembles a state OMK team, whose mission is to create sustainable state and community support networks to educate citizens on the impact of the war and deployments on military children and families, and also to develop and deliver educational programs for youth and families of deployed soldiers. As a result of their rapid response to needs of military youth and families during high deployment times, 4-H and Extension are being recognized as valuable resources for quality youth and family programs and as skilled leaders in catalyzing community action to meet critical needs.

- 34 States have received Operation: Military Kids (OMK) grants totaling \$3million to provide support to children of National Guard and Reserve Soldiers and to educate citizens in military culture and impacts of deployments.
- 34 states have built statewide networks of support for children and families of National Guard and Reserve Soldiers.
- 4-H and Army have provided training for 189 State Operation: Military Kids team members from 20 states.
- 4700 OMK community stakeholders have been trained by OMK State Teams.
- 20 Youth Development and Technology Specialists from 13 Land Grant Universities are on assignment to Army Regions in support of 4H youth programming
- 1000 University and County 4-H professionals and volunteers and 3500 Army staff support 125 Army child and youth programs.

Rural Youth Development Program: 4-H through the 4-H Rural Youth Development program, 30,700 youth and adults were trained in youth/adult partnerships, starting a 4-H club in an after-school setting, or engaging youth in governance. In addition, youth and adults spent 492,000 hours implementing solutions that address community needs and 7,700 youth were recognized as positive contributors to their communities. In after-school programs, 5,400 staff members were trained, 510 4-H clubs were formed, and 500 youth assumed leadership roles.

National FFA Curricula (January 2003 to July 2004). With RYD funding, the National FFA Organization developed innovative curricula. The “LifeKnowledge” (LK) curricula, released first, helps agricultural education teachers in the public school systems to teach life-skills such as decision-making and problem solving. Researchers from the University of Arizona evaluated the “LifeKnowledge” (LK) curricula. Of the 369 public school teachers who completed the questionnaire, 81% of the teachers use it in their agricultural content classes, and 68% use it in their FFA chapters. Eighty-three percent agreed that LK lessons have been a positive experience

for them; 69 percent that all agricultural education teachers should use LK; and 86% that LK lessons teach students the skills they need for leadership, personal growth, and career success. (“Usage and Perception of the LifeKnowledge Curriculum.” (Elliot, J., 2005. LifeKnowledge Usage and Perception. University of Arizona)

OUTCOMES

Short-Term

Youth

The National 4-H Impact Assessment Project (2001) is a national study of youth in grades 4 through 12 who participated in 4-H clubs, school enrichment, special interest programs, and after-school programs; 2,467 young people and 471 adults completed a survey that examined the critical elements of 4-H youth programming and outcomes. The study found that youth who participate in 4-H have a strong sense of belonging, feel emotionally and physically safe in these settings, and develop positive relationships with supportive, caring adults. Youth who report being in 4-H for longer periods of time have higher scores on measures of learning in 4-H, as well as higher scores on a measure of “helping others.”

Bruce and colleagues examined the development of leadership life skills among members of a State 4-H Council, a governing body that plans retreats, conferences, and camps for the 4-H members in their state. They also examined the transfer of these skills to other areas of a young person’s life after leaving the Council. Skills that young people reported gaining through their term on the State 4-H Council included decision-making, relationship-building, understanding of self, learning, management, navigating group processes, and communication skills (Bruce, Boyd & Dooley, 2003; Bruce, Boyd, & Dooley, 2004).

4-H Adventures in Russia, A Rutgers Cooperative Extension 4-H program offered lessons each day during a 2-week overnight camp hosted by an English Education agency in Moscow. 91 percent of teens and 75 percent of youth reported they would change their eating habits, 89 percent of teens participating in the Goal Setting workshop planned to use or share what they learned, 82 percent of all youth planned to share what they learned from the Resolving Differences Democratically Session, and 75 percent reported they would change the way they think, act, or feel after participating in the cooperative trust session. Ninety-two percent found the information in the Resisting Negative Peer Pressure Session useful, and 75 percent planned to use or share what they learned.

Evaluation for the Rural Youth Development Grant program was conducted by land-grant university educators and evaluators, and offered an online system for data collection. The projects built positive relationships with both youth peers and adults as they developed important life skills. Youth reported increases in standards of fairness and respect as well as opportunities for skill building. In addition they had positive perceptions of youth voice, trust, and youth involvement in discussions. Increased skills in decision-making, responsibility, and goal

achievement were reported frequently by the youth. According to youth and adults, the programs gave the young people opportunities “to belong.”

Medium–Term

Youth

In 2000, **Montana Extension Service** conducted a survey of youth in 4-H in grades 5, 7, and 9 (and youth not in 4-H) in 21 randomly selected counties in the state. Youth were considered to be 4-H members if they had been participating in 4-H for at least a year; 4-H members were compared to non-4-H youth on a variety of dimensions. Data from 2,500 youth were analyzed. Results indicate that 4-H participants are more likely than other youth to participate in other out-of-school time activities or programs; be involved in leadership roles; help others in the community; and excel in school. Moreover, 4-H youth are less likely than youth who are not in 4-H to engage in problem behaviors such as shoplifting or stealing and using cigarettes or illicit drugs. 4-Hers are also more likely than non-4-Hers to go to a non-parental adult for help with important questions in their lives and are also more likely than non-4-H youth to talk to their parents about concerns about drugs, alcohol, sex or other serious issues.

Several other states, including **New Mexico, Colorado, Idaho, and Utah** have replicated the Montana Extension Service study and have found similar results. For instance, Idaho replicated the Montana 4-H study and collected 3,601 surveys from 5th, 7th, and 9th graders in 53 randomly selected schools during the fall of 2002 and spring, 2003 (Goodwin, Barnett, Pike, Peutz, Lanting, & Ward, 2005). In this study, 4-H participation was defined as involvement in 4-H for two years or more. Goodwin and his colleagues found that Idaho youth who participate in 4-H are less likely than their non-4-H counterparts to report engaging in problem behaviors such as shoplifting, drug use, vandalism, and smoking, and 4-H youth are more likely than non-4-H youth to report being successful in school, helping others in their communities, and taking on leadership roles. Idaho 4-H youth also report better relationships with adults than youth who were not active in 4-H.

Unhealthy lifestyles have led to increased adolescent obesity, Type 2 diabetes, and other health risks. In 2003, The Center for Disease Control determined Kentucky to be the least active state in the nation. The **4-H Health Jam program, University of Illinois**, combines an overnight experience with a school enrichment program of eight weekly sessions. To promote physical activity and health, educators teach adolescents about the benefits of healthy living, being physically fit, as well as about possible career opportunities in health-related fields. Evaluation findings show a statistically significant ($p < .05$) difference between the pre- and post-tests ($n = 38$) on knowledge, attitudes, and behaviors. At the end of the eight-week follow-up, 80 percent of students had met or exceeded the goal of 30 minutes of daily physical activity.

CareerSmarts. North Carolina State University Cooperative Extension Service 4-H and Youth Development, conducted an evaluation of the 4th edition of *CareerSmarts*, a research-based career development program designed for use with early adolescents in voluntary youth organizations. The study evaluated both the leader training and adolescent program phases.

Twenty-nine adult program presenters and 382 students, including a control group, from five counties were evaluated in four critical areas using pre- and post-test questionnaires. The evaluation concluded that the program successfully instilled such basic job seeking skills as the ability to interview successfully, writing an appropriate resume, and completing a job application form. (CRIS #0183467)

Seeds to Success Youth Farmstand Project, Rutgers Cooperative Research and Extension, an entrepreneurial and life skills training program, prepares at-risk special needs 14-18 year olds for the workforce. Youth are taught how to select and prepare locally grown fruits and vegetables for use in meal preparation and how to handle money and simple banking procedures. They practice workforce readiness and business skills, as they sell produce and manage a youth-run farm stand during a nine-week summer work experience. In 2004, 25 of 28 students completed the program (a 89 percent retention rate). At the end of training and at the end of the selling season, youth were tested on skills in five areas: 1) making change and processing government vouchers; 2) identifying produce; 3) using a cash register; 4) using a produce scale (and knowing equivalent weights); and 5) knowledge of produce-related measurement terms. Participants demonstrated a statistically significant improvement (alpha .05 or less) in three of the five areas: 1) making change; 2) identifying produce; and 3) using a produce scale. Total scores resulted in a statistically significant increase in skills (alpha = .014).

The Eagle's Nest/Owl's Roost Environmental Discovery program, Colorado Cooperative Extension, gives 4th and 5th grade students the opportunity to experience Colorado's natural and cultural history through hands-on, out-of-doors experiences. Colorado's Front Range communities have experienced exponential growth and development over the past few decades. Much of this growth is due to migration from other parts of the country and immigration from other countries. ENOR educates future homeowners, small acreage managers, and decision-makers about sustainable ecological techniques and wise-use practices. End-of-program survey results from 48 percent of parents and 86 percent of students were analyzed. Findings include that 100 percent of 5th grade and 98 percent of the 4th grade students identified at least one action they would take to help the environment. Participants also identified one practice (skills such as compass reading, safely observing wildlife, and environmental education games and activities) they would teach or share with their families.

CYFAR: Louisiana. In De Soto Parish, 46 children in grades K- 6th participated in the CYFAR YES program. Thirty-six children in the 4th grade involved in standardized testing receive intense tutorial programming in math and language arts by Southern University CYFAR staff. The children participating in this tutorial after-school program were identified by school administrators. These 36 students have repeated a grade more than one time. Of the ten participants in the program who had either failed or scored in the lowest passing percentile in the Louisiana Educational Achievement Program (LEAP) standardized test in 4th grade, all passed and did not have to repeat the fourth grade.

All the students surveyed believed they learned math skills, 70% stated that the program helped them with the LEAP test this spring and summer, and 85% reported being better able to solve reading problems, multiply, divide and subtract.

Adults

The 4-H Youth Development Apprenticeship Program, Washington State University, trains and educates adult youth workers (18 and over, currently employed by a 4-H program) to increase their skills in youth development and to improve the quality of services to youth. The apprenticeship training includes structured on-the-job training (OJT), related instruction (RI), professional standards for competence, and mastery of skills, and supervision and mentoring from a Master Practitioner. Thirteen pairs of Apprentices and Master Practitioners participated in the nine-month pilot. Based on qualitative and quantitative data, the evaluators report increased knowledge and skills in “working with advisory boards, resource management, understanding of youth development, leadership, ability to handle criticism, broader view of Extension, confidence and preparedness, ability to handle stress, developing skills to work with teens, and time management”. Evaluators also found increased levels of job interest among Master Practitioners.

A professional development travel exchange between Oregon 4-H Agents and Australian school teachers led to the development of **Corroboree, 4-H Across the Seas Science Education Website**, Oregon State University Extension and the Oregon 4-H Center. Participants in this web-based science education program are youth engaged in 4-H science clubs using outdoor classrooms with five schools in Oregon and Australia. Students liked the pictures and graphics on the web site; the organization of the web site lessons; and the ease of use of the on-line data collection pages. Evaluation results show statistically significant changes in using the web to learn science ($p = .072$; $N=69$) and liking to learn about people from other countries ($p = .043$; $N=66$).

The **Cyber Town** program, University of Maryland Cooperative Extension Service, Woodrow Wilson Community Center, targeted youth who lived in an area with limited access to technology, attending schools without an Internet connection. Community members -- teachers, parents, and business leaders -- did not want youth to fall behind, so an after-school program was initiated that taught youth computer skills. Many participants were found to lack critical reading and comprehension skills. The Cyber Town program was modified to address these issues as well: youth worked to increase their computer literacy, their ability to complete homework, and their reading comprehension. They also learned how to use E-mail and the Internet. Program evaluators used pre- and post-testing to measure age-appropriate reading comprehension. Pre-test scores showed a mean of 52 percent with a standard deviation of 22. Post-program mean scores were 73 percent ($SD=8$), an overall increase by 21 percent. Teachers reported that participants were better behaved and submitted more complete and accurate homework. Cyber Town participants also had fewer referrals to the school principal than non-participants. Report cards showed continual increases in GPA over a nine-month period.

Boleman, Cummings, and Briers (2004) focused their **examination of life skills in 4-H** on a specific type of 4-H activity—a 4-H beef project. A sample of youth was randomly selected from a pool of 6,347 3rd through 12th graders who had expressed an intention on their enrollment forms to own a beef project during 2001. Parents were mailed questionnaires which focused on a set of 13 specific life skills. Parents who participated in the study indicated that their children's participation in the beef project influenced the development of life skills. The five skills acquired by youth cited most often by parents include: accepting responsibility; setting goals; developing self-discipline; being self motivated; and knowing about the livestock industry. Developing self-discipline and self motivation had moderate, positive relationships with years of participation in the 4-H beef project.

Long-Term

Long-term results from research funded in 1999-2004 are not yet available, but results from work in progress stemming from well-run science-based programs are expected to increase the knowledge, skills, and behaviors needed by youth to create fulfilling lives for themselves. Youth experienced in engaging in community service, using their skills in real-life contexts, are expected to improve social, economic, and environmental conditions in their communities. Adults are expected to work with youth to create safe and supportive environments within programs and in communities, in which youth can thrive. Community partners and policy-makers are expected to make changes in policies and community conditions to improve the quality of life in communities.

Some data on long-term outcomes are available from studies following youth in previous cohorts served by positive youth-development programs.

Youth

In a recently published retrospective **study of 4-H alumni** who graduated from high school between 1999 and 2003, Fitzpatrick (2005) and her colleagues found that between 60 and 90 percent of alumni who were interviewed reported learning life skills in 4-H such as accepting people who are different, community service, making healthy choices, and job skills. Common themes that emerged from an open-ended question, “what life skills did you gain in your involvement in 4-H?” included the development of self-esteem, teamwork, responsibility, cooperation, and organizational skills.

Radhakrishna (2004) researched **alumni of 4-H** programs in Pennsylvania. He found that skills learned in 4-H continue to influence 4-H participants in later life and career experiences. Pennsylvania 4-H alumni who were members of other youth organizations view 4-H as most helpful in teaching subject matter skills, communication skills, teaching responsibility, and participation in community activities. Enrollment in 4-H and completing 4-H projects contributed to leadership development, decision making skills, communication skills, and willingness to take responsibility.

SUCCESS STORIES

Youth as Resources for Strengthening Human and Social Capital in Rural Areas,

University of Illinois Extension, (CRIS #0196860) was designed to strengthen developmental supports and increase technology related job opportunities available to high school students in rural areas, and to increase youths' engagement in and commitment to their rural community. The long-term goal is to promote rural socio-economic revitalization and rural youth retention, by educating and engaging rural youth in leadership and entrepreneurial roles that capitalize both on their interests and abilities, meet the community's specific needs, and use and develop existing community assets. This mapping project required collaboration by educators, local high school principals, agricultural educators, and FFA representatives in Knox and Pike counties. Extension educators, serving as community liaisons, were trained to lead the project. Students mapped their communities and created a resource directory, describing employment, educational, job training, recreational, and health-related opportunities and services available to youth, as well as instructions for successfully accessing these resources.

In four high schools based in the two target and two comparison communities, 358 high school juniors and seniors were assessed on their youth's perceptions of community receptivity, the degree to which they could play a meaningful role in their communities as adults, and intentions to live or work in their community in the future. Sixteen students participated in the summer project, learning communication and interviewing skills necessary for approaching business owners and agency directors. They investigated all possible resources for youth in their community, administered surveys, conducted interviews with relevant personnel, and organized information. Business owners and agency directors completed surveys detailing how their organizations are designed to meet youth needs.

Individual interviews were conducted with each student who participated in the mapping to assess whether and how the intervention provided them with a new understanding of their home community and how the experience shaped their future plans for living and/or working in their community. Students reported discovering more opportunities available for teens in their hometowns than they had known about before the project began. Many commented that this experience helped them see how they could live and work in their community as an adult. Youth reported that most community leaders and business owners viewed their project favorably. Two students were offered jobs, as their interviewees were impressed by their interviewing skills, professionalism, and poise. Several businesses and organizations were stimulated to promote or create new opportunities for teens. For example, an opportunity to job shadow members of the police department resulted from the students' interviews with their local police department. The students also identified areas where services for youth could be improved.

The **4-H Forestry Education Program** in Chelan County, Washington State is a unique natural resource education program offered to students. The student groups have substantial representation of minority groups, low-income families and gender parity. The program engages local youth in "Outdoor Classrooms" where they learn about the environment and natural resources surrounding their communities. Students develop an understanding of the relationship

between healthy forests and healthy communities. With resource partners from over 30 local, state and federal agencies, student participants conduct water quality surveys, and monitor staff gauges and stream velocities in support of local watershed planning efforts, collecting field data for various fish and wildlife studies and helping to build and maintain trails, campsites, and wilderness areas for public use.

The 4-H Forestry Education Program is in the fourth year of operation with one year remaining on the current funding schedule. The success of this program is measured both through the use of structured evaluation tools and through observation of what students are doing with their lives as a result of their participation. Participants complete a Washington State University developed and proven “Life Skills Evaluation” with documented results indicating over 90% of participants reported significant gains in pre-post program measured objectives. The students’ gain increased recognition and understanding of the issues facing local government, natural resource managers and the local economy, while serving their communities and gaining valuable insights into both employment and educational opportunities. Local schools are reporting significant improvements in student behaviors and a renewed interest in classroom activities as a result of participation in the program. Program participants have been recruited and trained by local U.S. Forest Service Districts, one student was placed with the National Parks Department and several students chose to enroll in regional colleges and universities to pursue degrees in the natural resource field as a result of their involvement in program activities. Agencies receive additional help in monitoring the environment. The community benefits from increased stewardship and service. Added financial and social benefits are predicted in increased social and financial benefits from increased human capital, social capital, and environmental capital, while expenses and impacts related to juvenile crimes, truancy and other associated negative behaviors are reduced. The program received the prestigious “Caring for the Land” award from the U.S. Forest Service for “Outstanding Environmental Education Program” and garnered national attention from the National Association of County Officials for involving youth in community service and local government.

Children, Youth and Families Research Education Network (CYFERnet) Children, Youth and Families Research Education Network (CYFERnet) offers electronic information management and distribution, on-line project reporting, peer review of electronic documents and on-line resources. Now supported by Extension professionals, it serves as a model for e-Extension. The basic principles underlying CYFERnet are:

- Establishing consensus on national standards and a juried process to ensure the appropriateness of the research base of national database materials;
- Collaboration across universities to share existing resources, new resource development, perhaps even sharing faculty - for cost effectiveness and efficiency; and
- A distributed electronic system - resources hosted on servers at authors' universities but available to all.

A rapid response is vital: Immediately after September 11, 2001, CYFERnet posted information on helping families respond and cope with terrorism and fear. When the war started in 2003, CYFERnet posted resources for military children, parents and care providers.

Tufts University's Child and Family WebGuide gave CYFERnet a four star rating for quality and relevance. In 2003, CYFERnet was recognized by Agriculture Secretary Ann M. Veneman with USDA's highest honor, the Secretary's Honor Award. CYFERnet was cited for building a cost effective, multi-university, human and technology network; peer reviewing and posting over 3,000 high quality resources; and serving 66,000 at-risk youth and families in over 200 community programs.

Programs of Distinction

Programs of Distinction is a peer-reviewed process managed by National 4-H Headquarters. It is designed to identify and disseminate best practices in youth development programming. A selection of Programs of Distinction active between 2000 and 2004 are summarized below. The five below are 2005 winners of the Family Strengthening Awards, sponsored by the Annie E. Casey Foundation through National 4-H Council. This honor rewards innovative, exemplary, and effective 4-H youth development programs that improve outcomes for rural, disadvantaged families.

Safe Schools/ Healthy Students Collaborative, Rutgers Cooperative Research & Extension of Cumberland County 4-H Center

Family support and involvement is one of the key factors that research documents can help children succeed in school. Youth in some areas face an overwhelming number of academic, social, and emotional risk factors. The Safe Schools/Healthy Students program uses science-based and promising programs to create safe and healthy schools, institute educational reform to include high standards for all students, expand out-of-school learning opportunities, increase community knowledge, and build infrastructure. It provides students with a coordinated and enhanced plan for activities, programs, and services focusing on healthy childhood development and preventing violence and alcohol and other drug abuse. Workshops for families and their children addressed family involvement in helping children succeed, how schools can encourage more family involvement through revised policies and procedures, fostering communication, and supporting staff interactions. The workshop led to facilitation of the development of action plans in schools, and on-going support is given to the collaboration. Findings from end-of-program evaluations include: 48 percent of participants indicated they were more committed to family involvement; there was a 9 percent increase in knowledge from before and after the training regarding the role family involvement plays in children's success; and 67 percent reporting they "knew a lot about ways to encourage family involvement at my school" compared to 26 percent who reported the same prior to the training. Six months following the training, 95 percent of participants reported that the information presented was valuable. Rowan University, responsible for evaluating the Millville Regional Safe Schools/Healthy Students Collaborative federal grant found an increase in out-of-school programming (to 314 programs or a 135 percent increase), an increase in parental programs (to 147), and an increase in parental/family

participation (to 11,444 parents per year by 2003/2004). See <http://www.national4-hheadquarters.gov/about/pod-leadership/safeschools.pdf>

Attitudes for Success, Oregon State University-Umatilla County

The Attitudes for Success Youth Leadership Program was developed to provide opportunities for Hispanic youth to develop life skills and to be involved in their communities. As 30% of Hispanic high school students drop out of school in the Umatilla/Morrow Education Service District, the program provides information about community leadership and college opportunities. The program includes an annual daylong leadership/college preparation conference, and a youth leadership board providing intensive leadership opportunities on a monthly basis. Oregon State University reports that five communities created school-based multi-cultural leadership clubs to enhance diversity, and former graduates who've attended college have returned to speak to the students about the impact of the program and the importance of college. Schools provide student release time, busing, and faculty support so that youth may participate in the program. Of the more than 4,300 Hispanic youth who have participated, 86% reported the program helped them gain leadership skills, and 95 percent indicated their involvement increased their likelihood to attend college. See <http://www.national4-hheadquarters.gov/about/pod-leadership/attsuccess.pdf>

4-H LIFE (Living Interactive Family Education Program), University of Missouri

Staff conducted focus groups with families of offenders to help families and children of incarcerated men and women. The Living Interactive Family Education program (LIFE) was created to help children and youth successfully overcome the challenges of parental incarceration. At monthly meetings, children, parents, and care-givers work together on traditional 4-H club activities in order to develop life skills, to help youth avoid incarceration, and to remove barriers between offenders and their families. The program evaluation measured changes in academics and learning; goal setting and goal achievement; decision making; problem solving; communication; social competencies; and self-esteem. Findings indicate that the program has helped children and youth improve in these areas, with the greatest differences in social competencies (by 23 percent), communication skills (by 18 percent), and decision-making skills (by 12 percent) between baseline to 6 months. See <http://www.national4-hheadquarters.gov/about/pod-leadership/4hlife.pdf>

Strengthening Families through Adventure Based Initiatives, Rutgers Cooperative Extension.

Family Camp began as a CYFAR initiative from 1999-2002 and has continued with other funding. Family Camp is a therapeutic adventure therapy and family therapy program to increase communication among family members; provide opportunities for family socialization and fun; identify barriers to positive communication; identify values the family feels are important; identify barriers to family values; and provide opportunities to practice. At-risk families attend a weekend-long experiential, hands-on educational program to build on family strengths using adventure-based activities. Thirty families have participated in the program since 1999. Participants reported the teaching effectiveness of the program at 4.61 (on a scale from 1-5), and program content at 4.5. Findings from a teaching effectiveness form presented on the last day of camp (4-year averages) were: 100 percent of children and parents were more interested in

the family strengthening experience; 96 percent reported they would do something new or different as a result of their experience in the camp; and 89 percent “would change the way they think, act, or behave, and planned to share what they learned with others.” Several weeks following the camp, participants reported the camp increased family members’ trust and positive communications; increased time families spend together; and improved family problem solving skills. Parents also reported increased respect and patience among family members. See <http://www.cyfernet.org/fam/torretta.html>

UNL for Families, University of Nebraska Cooperative Extension.

The UNL for families program is designed to strengthen families by increasing commitment; enjoyable time spent together; ability to manage stress and crises effectively; spiritual well-being; positive communication; and appreciation and affection. The program uses broad-based mass media, family education opportunities involving youth and their parents, and focused training on specific subjects. Evaluation findings show that UNL for Families researched-based training and materials have reached more than one-third of the state residents (560,000) through various multi-media events. The website (with learn-at-home modules and other tools) had more than 54,600 hits in 2004. Nearly 1,500 people participated in at least three hours of family strength educational programs: 88% reported increased knowledge of how to strengthen their family, 69 percent indicated they would use one of the techniques within the next three months, and 75% also indicated they would strengthen their families by “eating together as a family, going to church as a family, listening more attentively to their children and turning off the TV.” Extension staff contacted a random sample of 25 percent of these participants. Twenty-five percent of these participants indicated they were carrying out their goals. See <http://www.national4-hheadquarters.gov/about/pod-leadership/unlfamilies.pdf>

Rural Youth Development: North Dakota. (4-H and FFA) Eighteen-year-old Brianna Bohmbach, Watford City, North Dakota, led an effort to preserve her progressive ranching community’s Wild West past. Working closely with the Mandan, Hidatsa and Arikara tribes on the Fort Berthold Reservation, local historians, FFA, McKenzie County Commission and Watford City Council, Brianna and other 4-H members created an exhibit for the new Long X Visitors Center and Pioneer Museum in Watford City. Tourism is integral to the county, which averages three people per square mile. Brianna led the group of youth and adult volunteers as they researched and wrote the timeline of the settlement and economic development of the county, interviewed Native American elders, and mapped historical areas with geographic information system technology. Brianna will continue to work with the museum until she leaves for college where she will pursue a communications degree so she can continue this type of work. “This project taught me about team effort and what I am capable of. My confidence in my leadership skills has greatly improved...I now know how important my work is now and in the future,” Brianna said.

NEW DIRECTIONS

The CSREES Portfolios are defined by the Knowledge Areas (KA) that best align with the Strategic Plan and its objectives. The KA for 4-H Youth Development is a new Knowledge Area that will be introduced in the Plan of Work process in the fall of 2007.

The inclusion of 4-H Youth Development was explicitly requested by Extension. For the first time, it will be possible to capture the relevance, quality and impact of 4-H Youth Development programs. 4-H Youth Development extends the research-based knowledge and programs of the Land-Grant University to young people and can measure its practical application, particularly in the areas of science and technology, and health and well-being, and the role young people play in improving the social, environmental and economic conditions in their communities. The success of 4-H Youth Development has been its ability to leverage resources, collaborate at the local, state and federal levels and create safe and supportive environments for young people that continue to be sustained long after specialized funding is over. The inclusion of KA 806: 4-H Youth Development reinforces the need and potential for integration of the education, research and extension functions of CSREES and its partners around the discipline of youth development.

Using an agreed upon set of outcome indicators and with the support of Evaluation and Accountability personnel at CSREES and our LGU system partners, a comprehensive reporting and evaluation effort is critically needed to measure program quality and impact of 4-H Youth Development programs and its relationship to community quality of life. With the introduction of the comprehensive, integrated reporting system identified as ‘OneSolution’ it will be possible to link the outcome indicators of 4-H youth development more explicitly with research, higher education and extension.

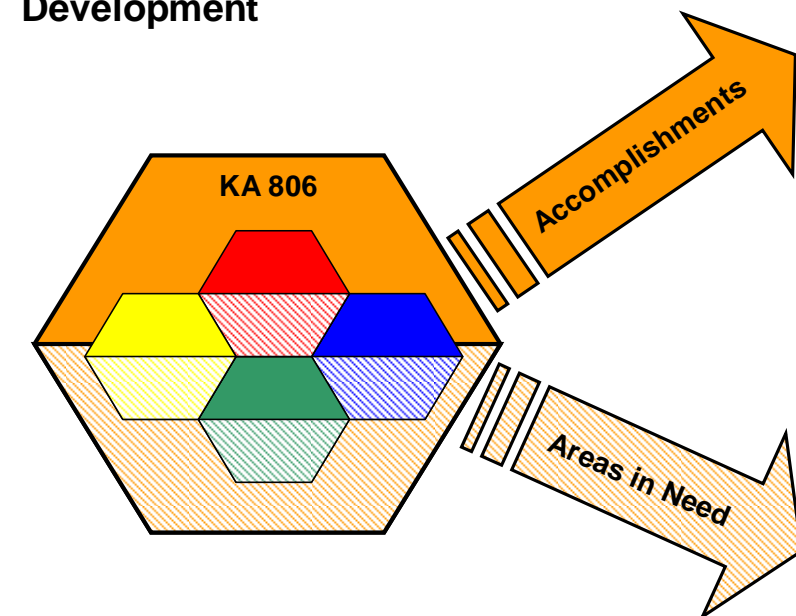
Additional future developments include more and new initiatives in specific areas, including:

- Science, Engineering and Technology. 4-H youth development brings the application of technology to rural as well as urban youth through programs such as water quality testing, interpreting ultrasound images, use of GPS and GIS in production agriculture and the management of natural resources, ethical use of bio-engineering and even the effects of zero gravity on crop production in space. Youth learn and demonstrate the practical application of the Land-Grant Universities’ knowledge and research base for the benefit of their communities, including eXtension. (Also see KA 803).
- Healthy Lifestyles: 4-H youth development focuses on teaching life skills such as decision making, responsibility and, how to use knowledge about nutrition and disease prevention to make healthy lifestyle choices. Young people learn the value of eating well and increasing physical activity which in turn, helps address the national concern for childhood obesity. (Also see KA 724.)





- Citizenship: Through 4-H youth development, young people learn the skills to communicate, serve in leadership roles, and become engaged in their communities so they can help address positive changes that support healthy, sustainable communities.









Figure 30 – KA 806 Honeycomb

Knowledge Area 806: 4-H Youth Development



KA 806 - Major Themes

-  The 4-H Youth Development Program
-  Children, Youth and Families at Risk (CYFAR)
-  4-H for Youth with Parents in the Military
-  Rural Youth Development

	<ul style="list-style-type: none"> •1,500 local conversations on youth development held across the US identifying issues, combining with 63 state conversation & 200 youth & adults attending a National Conversation on Youth Development. Updated the 4-H professional research, knowledge & competency model for 4-H youth development educators
	<ul style="list-style-type: none"> •Increased capacity & commitment to support community based programs for children, youth & families at risk. Provided technical assistance to communities & CYFERNet, an electronic infrastructure to link networks to assist communities with computer & technology issues, reached over 50,000 youth & over 300 communities.
	<ul style="list-style-type: none"> •Used tax dollars & resources effectively by joining 4-H youth development expertise with the Army's goal of developing model youth programs. Every Army installation around the world & most Air Force bases have a 4-H program, with 15,000 Army & Air Force youth enrolled.
	<ul style="list-style-type: none"> •30,700 trained in youth/adult partnerships, starting 4-H in an after school setting or engaging youth in citizenship. 7, 700 youth recognized as positive contributors to their communities In after school programs, 5,400 staff members trained, 510 4-H clubs formed, & 500 youth assumed leadership roles.
	<ul style="list-style-type: none"> •Create more comprehensive reporting & evaluation efforts to measure program quality & impact. Intentional focus on three 4-H mission mandate areas.
	<ul style="list-style-type: none"> •Greater integration of education, research, & extension functions of CSREES & its partners around discipline of youth development.
	<ul style="list-style-type: none"> •Continue to leverage resources developed through military partnerships to benefit 4-H Youth Development program.
	<ul style="list-style-type: none"> •Continue to develop programs & resources that support needs of rural youth.

Section IV – Criteria and Dimensions of Panel Review: Relevance, Quality and Performance

Portfolio Assessment Report

RELEVANCE

Scope

Portfolio 2.2 encompasses CSREES' work to "provide science-based technology, products, and information to facilitate informed decisions affecting the quality of life in rural areas." The well-being of communities depends on the social, environmental, and economic strengths and the physical and mental health of the residents. One integral component of community well-being is the degree to which youth and adult residents can satisfy their basic needs, including food, clothing, housing, education, and health. Also critical is the capacity of residents, families, and businesses to effectively manage their money, resources, time, and human capital.

CSREES is the primary agency in USDA that supports research, education and extension programs to rural areas. Cooperative Extension's historical role of disseminating information about innovative technologies, products and services has been critical to improving the prosperity and well being of rural communities in the U.S. CSREES is a sought-after partner in collaborative efforts with other federal agencies, foundations, and state and local governments. Although CSREES cannot unilaterally cover rural areas with programs in all the areas included in Portfolio 2.2, the agency does identify critical areas, partners with others, and leverages available funding to maximize the impact and sustainability of its work.

Several social, technological and environmental changes described in section 2 are particularly affecting rural areas in the U.S. For example, rural communities have experienced significant demographic changes, from the loss of working-age individuals to urban centers, where job opportunities are more plentiful, to an influx of migrant-laborers, or to individuals moving into rural areas seeking a lower cost of living or a different lifestyle. In addition, the number of agricultural jobs has diminished due to increased mechanization and the concomitant decrease in farming operations in the country. These changes have led to major shifts in land-use patterns and increased the need for service-related businesses, community development. Access to technological advances has often been limited to non-existent in most rural areas (e.g., high speed internet access or distance learning education centers), which has reduced the ability of these communities to grow. In addition, environmental health and worker safety issues are a continuing problem, which has resulted in a growing interest in land stewardship and in protecting people from exposure to pesticides, diseases, hazardous chemicals or bio-threats.

Critical changes described in Section 2 affecting rural areas include the gradual trend away from agricultural employment; demographic shifts as out-migration by the young in some areas and increasing in-migration by others seeking rural amenities alter communities, land use patterns,

and the need for services and businesses; a growing movement toward environmental stewardship, community enhancements and small business entrepreneurship that are aided by technological advances yet threatened by the “Digital Divide;” health and safety issues (including exposure to diseases and pests, bio-threats, pesticides, chemicals affecting home and business and threatening human health); and resource issues including savings and capital formation.

Hurricane Katrina dramatically illustrated the complexity of factors at work in rural areas, including:

- Differential impacts of disparities in resources (money, transportation, emergency and other housing) on safety and health;
- Lack of adequate technology for public safety and health information and warnings;
- Impact on the environment by failure of the ‘built’ environment – and subsequent costs to infrastructure; and
- Stresses on families caused by relocation and separation.

Portfolio 2.2 organizes a diverse body of projects around three central themes: Human Development and Societal Change; Health and the Environment; and Individual and Family Resources. CSREES addresses these and other issues in rural areas throughout the United States.

The linkages within land-grant universities between research and educational programs (on-campus or extension) uniquely position CSREES to support the development of knowledge and its subsequent dissemination and implementation. While partner agencies such as CDC, DHS, DOD, EPA, FEMA, HHS, HUD, NCI, NIH, etc. provide significant funds to support the improvement of rural quality of life, CSREES supports research, education, and extension efforts across a range of issues affecting quality of life in rural areas.

Overall, the 2.2 Portfolio has led to multiple outcomes through its support of basic and applied research, education, and extension initiatives. New knowledge generated by CSREES funds becomes a valuable resource to aid solution development by other partner agencies and organizations, including allied industries. Overall, CSREES investments have led to new and improved programs, products, techniques, and technologies to address issues such as:

- **Parent Education.** Research shows that the early years can be difficult for parents and that they require more information and advice to help them with challenging developmental issues. Cooperative Extension’s “age-paced” or “just in time parenting” (JITP) efforts meet these needs, as well as the needs of Extension staff seeking efficient and effective resources for parents. This approach is a “promising example of efforts to tailor media initiatives to the needs and preferences of harder-to-reach populations” shown to be effective in promoting positive parenting. The approach involves timing monthly delivery of easy-to-understand research-based parenting information so that a specific set that matches the age of a child is received “just in time.”

- **Youth Development:** Youth development in rural areas is vitally important to maintain vibrant communities. The 4-H program model, with over a 100 year history and membership of over 7 million youth and 500,000 volunteers, has been adapted to new initiatives, including: partnerships with defense agencies to support children in military families (Army, Air Force, and other service branches); efforts to strengthen states' ability to address high risk youth (CYFAR); and special funds to support rural children, youth, and family programs (RYD).
- **Military Families:** Today's military families face frequent deployments and increased family separations. These challenges can impact military readiness. CSREES, and partner organizations support military families utilizing special projects designed to curb family violence and support parenting, and support family readiness for deployments. The Air Force established the **Healthy Parenting Initiative** in partnership with CSREES and the Services and Virginia Tech to develop military-specific family support networks for the over 615,000 active duty military personnel with children.
- **Family Strengthening.** The UNL for families program is designed to strengthen families by increasing commitment; enjoyable time spent together; ability to manage stress and crises effectively; spiritual well-being; positive communication; and appreciation and affection. The program uses broad-based mass media, family education opportunities involving youth and their parents, and focused training on specific subjects. Evaluation findings show that UNL for Families researched-based training and materials have reached more than one-third of the state residents (560,000) through various multi-media events.
- **Communications and Disaster Education:** In the aftermath of Hurricane Katrina, it is vitally important to teach residents how to access dynamic local information and use it in emergencies. Youth 4-H Tech Teams have been training community members to use Geographic Information Systems (GIS) and Global Positioning Systems (GPS). By the end of 2007, all 50 states will have EDEN (Extension Disaster Education Network) and 4-H Community Readiness Teams working together.
- **EDEN**, established in 1994 following the floods in the North Central Region, used the diverse expertise of the land-grant system to serve communities affected by Hurricanes Katrina and Rita. As a result of successful work with NASULGC and DOE'S Building America Program, financial and technical support was extended to housing programs as the states begin to rebuild much needed housing. The Louisiana House on the Baton Rouge campus of Louisiana State University, a model house showcasing sustainable housing including multi-hazard resistant construction, has been the focal point for these efforts. EDEN has been selected as a pioneering Community of Practice for eXtension. See pp.196 and www.eden.lsu.edu
- **Financial Security in Later Life:** Preparing for retirement and potential long-term care costs takes planning, saving, and debt control. In 2000, "Financial Security in Later Life"

was identified as a national Cooperative Extension initiative. A toolkit of educational programs addressing saving, retirement planning, investing, long-term care, legal issues, and estate planning was developed for both web-based and face-to-face education. Partnerships were developed with AARP and the Consumer Federation of America to design, deliver, evaluate, and fund some segments of programming. An impact report released January 2005 showed a sample of 7,574 program participants who completed one or more programs in the toolkit reported a total of \$6,307,708 of annual financial impact (dollars, saved, debt reduced, new dollars invested). This averages \$833 per person per year. This initiative was selected as a prototype for eXtension, has received numerous awards from professional associations including the American Distance Education Consortium (ADEC) and the Association for Financial Counseling and Planning Education (AFCPE), and positioned CSREES to be represented amongst 20 agencies on the cabinet-level Financial Literacy and Education Commission. See pp. 84-85 and www.csrees.usda.gov/fs11.

- **Digital Divide:** Lack of cutting-edge computer technology and high-speed Internet access in rural areas drives the perpetuation of the “Digital Divide”. Addressing the technical feasibility and cost of broader high-speed Internet access is critical. PowerCOM, a hybrid modem developed with SBIR funding, supports wireless back-haul IP connections that are able to cover up to 8 miles between repeaters and supports 12 simultaneous toll-quality voice calls from each transformer on the power grid. PowerCOM technology provides rural areas with cost effective methods for using the existing power-grid infrastructure so that advanced voice and broadband services may be better accessed and utilized.
- **Rural Health Works.** Rural Health Works helps communities keep their health care dollars at home. Oklahoma State University has used Smith-Lever 3(b) & (c) funding to leverage funds from the Federal Office of Rural Health for Rural Health Works (RHW) to demonstrate the economic impact of the health sector. RHW found that as much as 20% of the economic base of a community/county comes from the health sector. Not only does that much economic value greatly impact the sustainability of the community, but has been found to be related to community livability which influences population growth and vitality. RHW has grown from a pilot with 5 states to a national initiative with over 35 states.
- **Medicare Education.** The new **Medicare Part D Prescription Drug Benefit** available to 40 million Americans provides a classic example of the need for enhancing health literacy and the role the Extension System can plan in health education. Most beneficiaries are not health literate or computer literate and enrollments for this program are managed on-line. A five-state project has utilized the strengths of extension’s collaborative networks to build unique educational resources for this new federal benefit.
- **West Nile Virus:** West Nile Virus (WNV) is an example of a newly emerging zoonotic disease in the US. In 2003, hundreds of people died and over 4,000

were sickened by the disease. A HATCH-funded research project on WNV in Florida has increased our understanding of epidemiological factors associated with the spread of the disease and provided more accurate predictions of the risk of a WNV epidemic in this area. Currently, models are now being developed to predict and map vector-borne disease outbreaks in humans, domestic animals, and wildlife in other regions of the U.S.

- **Lyme disease:** More than 1 million cases of Lyme disease have been estimated in the US and the economic costs are \$1 billion. The number of cases has increased 32 times since the disease first gained prominence in the early 1980s. A 1998 - 2003 HATCH project examined the prevalence and distribution of Lyme disease and Human Granulocytic Ehrlichiosis (HGE) in the eastern U.S. A second HATCH project is developing new antibody assays for humans as well as animals. These projects resulted in more sensitive and specific diagnostic tests to detect Lyme disease and HGE, which improved the detection of Lyme disease and HGE in humans and domestic animals.

Focus on Critical Needs of the Nation

The ability of the 2.2 Portfolio to remain focused on issues, topics, and critical needs of the nation stems from the unique structure of the CSREES. CSREES peer review of formula-funded research proposals and competitive grant proposals and similar reviews of state Cooperative Extension plans of work and annual reports ensures that programs and activities supported by CSREES funds focus on scientifically critical areas. The competitive review process especially encourages innovative ideas likely to open new research approaches to enhancing health and quality of life. CSREES linkages to the land-grant system and the extensive systems of communication with stake-holders ensure that different points of view are included in the generation and discussion of innovative ideas.

National planning activities and partner strategic planning efforts, such as the Science Road Map for Agriculture (2001), National Association of State Universities and Land-Grant Colleges (NASULGC), Experiment Station Committee on Organization and Policy help to guide state and regional level Extension programming toward meeting national needs.

A number of themes that exist in two or more of the Goal's problem areas illustrate where CSREES is contributing to timely, relevant research, education and extension directed to solving critical problems of national significance utilizing integrative models.

Human Development and Societal Change:

- Human development and family well-being – the social, cognitive, emotional, and physical development of children, youth, and adults throughout the lifecycle;
- Children, youth and families at-risk-equipping people with the skills they need to lead positive, productive, and contributing lives;
- 4-H youth development-providing opportunities for youth to develop skills and confidence for leadership and self-discipline; and

- Community planning and development - to enhance quality of life and the understanding of problems, opportunities, and planning for renewal and growth;

Health and the Environment:

- Healthy, durable, functional, resource-efficient, and affordable housing
- Home, farm, and community safety;
- Hazards to human health and safety;
- Animals and their systems (detailed in other portfolios);
- Wellness and fitness;
- Healthy lifestyles
- Food products free of chemicals;
- Disease prevention and management;
- Acquiring and understanding health care services;
- Establishing and maintaining a viable health sector in the community;
- Personal and community decision-making.

Health programs have clear linkages to nutrition research and education, food safety, AgrAbility and farm safety, pesticide use and protection; air and water quality; and environmental stressors.

Individual and Family Resources:

- Savings and the accumulation of assets
- Investment in human capital
- Access to technology and eCommerce
- Viability of family farms, businesses, communities in rural areas

The individual portfolio funding mechanisms (formula; special grants; competitive), while sometimes not able to provide sufficient funds for comprehensive approaches; can also leverage each other to allow more expansive projects.

Identification of Contemporary and Emerging Issues

CSREES identifies contemporary and emerging issues that are consistent and related to the portfolio and its mission by addressing priorities identified by Congress, paying attention to customers and stakeholders, participating in a range of professional and scientific activities, and by tracking current research in progress in sister agencies or reported in professional meetings and journals.

Setting priorities is an important means of facilitating the scientific and technological advances needed to meet the challenges facing residents of rural areas. Congress sets the budgetary framework by providing funds to CSREES. Members of Congress also make recommendations for the scientific and programmatic administration through appropriation language and through their questions and comments during Congressional hearings. Input into the priority-setting process is sought from a variety of customers and stakeholders. The Agricultural Research,

Education, and Extension Reform Act of 1998 formally requires that formula-funded projects reflect stakeholder priorities.

Participation by NPLs in review panels for competitive programs, federal interagency working groups, program reviews, and stakeholder workshops are important mechanisms for CSREES to identify emerging issues for Goal 2 Knowledge Areas. Collectively, NPLs also participate in professional and scientific society meetings covering all of the agency's species of responsibility to stay current on scientific developments related to CSREES programs. NPLs participated in annual meetings or conferences related to Portfolio 2.2 research, extension, and education efforts, including:

- 21st Century Community Learning Centers Summer Institute
- American Association of Family and Consumer Sciences
- American Council on Consumer Interests
- American Mosquito Association
- American Public Health Association
- American Society of Agricultural and Biological Engineers
- American Society of Microbiologists Conference
- Association for Financial Counseling and Planning Education
- Conference for Research Workers in Animal Disease
- CYFAR Annual Conference
- Entomological Society of America
- Environmental Systems Research Institute International Conference
- Extension Disaster Education Network (EDEN)
- Federal Reserve Board Community Development Conference
- Gerontological Society of America
- Housing, Education, and Research Association
- International Conference on Volunteer Administration
- National 4-H Conference
- National 4-H Youth Technology Leadership Conference
- National Afterschool Association
- National Association of Counties
- National Association of Extension 4-H Agents
- National and Community Service Conference
- National Council on Family Relations
- National Extension Association of Family and Consumer Sciences
- National Extension Technology Leadership Conference
- National Institute for Farm Safety
- National Rural Health Association
- Priester National Extension Health Conference
- Public Issues Leadership Development Conference
- Regional Volunteer Leaders Forums

- Smart Marriages – Happy Families Conference
- Society for Research on Adolescence
- Society for Vector Ecology
- United States Animal Health Association

The complete range of contemporary and emerging issues addressed by CSREES can be assessed by reviewing the issues identified in the situation statements of the logic models for each knowledge area. Among the critical issues recognized to have significant costs identified in this reporting period are:

Human Development and Societal Change

- Communication, information, and mapping needs in the event of natural or man-made disasters;
- Needs of military families, as parents in the military are sent on multiple deployments overseas, leaving spouses and children to cope;
- Skills necessary to live and work in a more competitive global economy; and
- Better deployment of human, social, natural, and built capital (infrastructure) in rural areas.

Health and the Environment

- Shortages of available housing to meet the needs of the rural workforce – and housing needs of those displaced by natural disasters;
- Aging population issues including topics such as reverse annuity mortgages, universal design and aging in place, breathing difficulties, and adequate heating.
- Providing housing for older people who seek retirement housing but cannot afford market prices and providing home modifications as well as good space planning to help older adults live independently and safely.
- Growth is placing increasing pressure on the natural environment, thus necessitating new land use and housing configurations (including concepts such as smart growth) to better protect the natural environment and rural amenities.
- Hazards to the health, safety, and biosecurity of people (such as pathogens causing food-borne diseases, and deaths caused by the release of microbiological agents such as anthrax, and other biological threats);
- Insects and other pests affecting humans (e.g., termites – causing over \$2 billion dollars in damages to structures across the U.S.);
- Zoonotic diseases and parasites affecting humans (i.e., parasites and animal diseases such as West Nile Virus, malaria, encephalitis, Lyme disease, and human granulocytic ehrlichiosis) that pose threats to human health;
- Protection for first-responders, farm and other agricultural workers from bio-hazards, chemicals, and ultraviolet radiation afforded by protective clothing using new fibers and finishes.
- Housing and indoor environment-assisting consumers and professionals with issues related to housing affordability, healthy homes, sustainable housing, and indoor air

quality; and community planning and development-to enhance quality of life and the understanding of problems, opportunities, and planning for renewal and growth;

- Farm safety and health, preventing work-related injuries, assisting the disabled;
- Lack of ‘health literacy’ -- understanding of medical information, the health care system, and health provider’s instructions – contributing to failure to follow healthy life-styles, take preventive steps, and to use medical resources well, contributing to an estimate \$260 billion per year in economic output lost due to health reasons; and
- Rural, minority, and medically underserved areas (where the Extension Service may be the only agency providing health education).

Individual and Family Resources

- Need for better management of time, money, and human capital, as evidenced by increasing consumer debt, low savings, or lack of access to financial services;
- Civic engagement and entrepreneurship, hallmarks of prosperous communities, are reduced due to financial pressures on individuals and families;

Integration of CSREES Programs

The functional integration of the CSREES research, education, and extension efforts in Portfolio 2.2 is created by strategies supporting integration and demonstrated schematically by the logic models for each Knowledge Area and the specific examples cited.

- CSREES has 57 funding lines and 64 programs, so integration has been challenging. In FY2003, to encourage such integration, Congress authorized CSREES’ use of National Research Initiative (NRI) funds to include up to 20% integrated activities.

Serious efforts have been undertaken to implement integrated programs through the combination of research, extension and educational activities. Specific examples of integration of research, education, and extension activities that show the synergy generated by these linkages include:

- Learning about and application of information technology and telecommunications, with research addressing factors that influence the learning of cyber skills throughout the community, and then employing this information in training programs, and then evaluating and improving trainings, so that individuals and communities have gained awareness and skills and then successfully employ them, as in Tennessee, where several communities launched community mapping programs with GPS/GIS technology, p. 166;
- 4-H Youth Development relies on extension to extend the research-based knowledge and programs of the Land-Grant University to young people, and measure its practical application, particularly in the areas of science and technology, and health and well-being, and the role young people play in improving the social, environmental and economic conditions in their communities.
- **Energystar** (funded by USEPA and USDOE) and the **Build America Program** (funded by DOE and administered by NASULGC) educates researchers, builders, consumers, and others on energy efficiency and high performance homes. Success of the 7-state Build

America program led DOE to develop a pilot outreach project using research materials from their Build America Program.

- A focus on farm succession planning serves as a good example of integration of research, education, and extension initiatives. In studies funded by CSREES-USDA and the National Endowment for Financial Education, Purdue University interviewed farm families about their retirement and estate planning. Many farmers were uncertain about income or there was a lack of communication with other family members about farm transfer. To help solve the problem of income uncertainty, a “Retirement Estimator for Farm Families” <http://www.ces.purdue.edu/farmretirement/> was developed. Another site, “Who Will Get Grandpa’s Farm: Communicating about Farm Transfer” <http://www.ces/purdue.edu/farmtransfer/> helps farmers realize the need for early and effective communications. One faculty member has received two outstanding reaching awards for applying this research to the scholarship of teaching.

Close coordination between CSREES NPLs in different units of the agency: Economic and Community Systems, Families, 4-H, and Nutrition, and Plant and Animal Systems units yielded more “integrated” results for the social and behavioral sciences aspects of the agency, regardless of funding mechanism limitations. For example, many projects in this portfolio, especially those in KA 806 overlapped with those in KA 607, 801, 802, 803, 804, and 805 of Portfolio 2.2. Also by bringing entire communities together to work on a particular issue, and then agreeing upon a single, unified roadmap to resolve that issue, projects and partnerships in this area were able to break down some of the traditional barriers that have impeded national cooperation and coordination across institutions and agencies. These projects seek to integrate both CSREES and non-CSREES current and future funding for a specified area. While CSREES recognizes that additional integration is still possible, significant progress has been made in recent years.

To ensure that a greater number of projects support extension and education aspects of research projects, a new project category called “Integrated Projects” was developed in the NRI competitive grant programs. To be funded, integrated projects must combine research, education and/or extension objectives to be considered for funding. In 2004, Congress authorized CSREES’ use of NRI funds to include up to 20% integrated activities. There are currently no examples of the use of such funding for support of knowledge areas within this portfolio. However, in 2005, Avian influenza was a high priority. Thus, the importance of integrated projects on zoonotic diseases for competitive grant programs will assume a larger role in the next 5 years future portfolio review.

West Nile Virus (WNV) is an example of a newly emerging zoonotic disease in the US. In 2003, hundreds of people died and over 4,000 were sickened by the disease. A HATCH-funded research project on WNV in Florida has increased our understanding of epidemiological factors associated with the spread of the disease and provided more accurate predictions of the risk of a WNV epidemic in this area. Currently, models are now being developed to predict and map vector-borne disease outbreaks in humans, domestic animals, and wildlife in other regions of the U.S.

Multidisciplinary Balance

CSREES specifically encourage multidisciplinary programs when soliciting proposals and requesting plans of work. Congressional language requires the NRI competitive grants program to support a minimum of 30% multi-disciplinary work, however the actual percentage achieved is closer to 40% or higher. Moreover, CSREES requires that 20% of the research formula funding that it provides to states be devoted to multi-state activities, which directly promotes multidisciplinary approaches for selected topics of importance to quality of life. In response, the regional agriculture experiment station systems use the funds to support multi-state research projects and committees. In addition, CSREES requires that 25% of extension funding support multi-state and multi-institutional programs.

From the extension and education perspective, multidisciplinary approaches, and involvement of end-users in the conduct of research experiments are well established practices in many states. This is especially true for multi-state research projects, where producers and other end-users are integrally involved in the projects. During the period of review, CSREES NPLs in these 2.2 related KAs served as advisors to 21 multi-state research projects (see Evidentiary Materials). These multi-state committees are making important contributions to their areas by strengthening existing collaborations across the country, including international linkages, and by beginning new partnerships that further broaden the committee's composition.

Examples of such multi-state programs referenced in Portfolio 2.2 include:

- Family Business Viability in Economically Vulnerable Communities (NE-167) examined the economic impact of family businesses and quantified the economic and social contributions of family businesses to their local, state, and national economies.
- The multi-state longitudinal study- *Tracking the Well-Being and Functioning of Rural Families in the Context of Welfare Policies-Rural Families Speak* focused on understanding the needs of rural families impacted by changes in demographics, public policies, and supportive community services p. 141.
- Healthy Indoor Air for America's Homes, working to improve the quality of indoor air in homes and the health of Americans living in those homes, includes forty-seven states, DC and two territories. In addition to concrete outcomes achieved, \$6.00 in other support was contributed for every \$1.00 invested by CSREES. The program stimulated the development of research and education programs in many of the states participating in the program (e.g., the Southern Region started the Children's Environmental Health Program). See pp. 193-194 and www.healthyindoorair.org
- Community mapping research involves youth in community development that draws on natural resources research, economic research and health research pp. 164-170 (KA 803).

As noted, the National Research Initiative (NRI) has recently become involved with the ESCOP Social Science group's initiative to better integrate the social sciences with NRI programs, with the expectation that this will lead to greater involvement of appropriate social scientists in scientific review panels. Examples of new perspectives and issues are:

- Investigating mechanisms to increase social acceptance of new technologies;
- Including economic assessment (e.g., cost/benefit analysis) of pest control strategies; and
- Addressing social or ethical consequences of a new technology (e.g., genetically modified organisms).

QUALITY

Significance of Outputs and Findings

The generation of significant findings in Portfolio 2.2 follows from the institutional practices used to link innovation and productivity and knowledge and practice, and can be demonstrated by enumerating some of the critical outputs and findings initially funded wholly or partially by CSREES that are being applied in the U.S. or replicated by other states or areas.

Institutional practices supporting innovation and productivity, thus leading to significant findings, include CSREES'

- Soliciting basic and applied research, education, and extension proposals from all U.S. institution types and supporting the best science and training through competitive peer review and larger awards (Competitive Funds).
- Stimulating interstate cooperation through multistate committees (Formula Funds and Competitive Funds).
- Focusing funds on targeted quality of life issues, national programs of state and regional importance (Special Grants and Critical Issues Funds).
- Supporting college/university faculty and graduate students (Formula Funds; Cooperative Agreements).
- Serving as the federal link to the extension and education infrastructure to disseminate timely and pertinent information, and as part of the feedback loop of research, education, and extension to learn from customers their priorities, reactions and their unmet needs and to find additional opportunities for advanced research and education (Formula Funds).

Research results and findings from formula funds have also contributed important accomplishments related to the improvement of quality of life. While the level of funding for formula projects is generally very low per project, their impacts are often only fully realized due to their leveraging of other CSREES and non-CSREES sources of funding. Formula funds primarily aid in providing different kinds of infrastructure support such as salaries (project director, post-docs, graduate students, special project staff) and supplies. Formula funds play an important role in allowing researchers to generate preliminary data for promising avenues that will then be submitted to CSREES competitive programs, and other State and Federal programs, for support.

Significant findings from projects in Portfolio 2.2 show substantial financial returns, or are being applied in the U.S. or replicated by other states or areas. These include:

- The success of the Manufacturing Technology Transfer program in delivering 221 technical assistance projects to 113 manufacturing firms in northwestern Wisconsin counties, resulting in creating or retaining 380 jobs and generated over \$16 million of new income, p. 163.
- The collaborative private-public partnership formed by the National Center for Biodefense Communications in Mississippi with Federal research laboratories (Lawrence Livermore and Sandia), universities with teaching programs in public health, veterinary science, and informatics-related subjects, non-profit corporations, and technology firms through CSREES' Federal administrative grant program to establish internet-based technologies to issue secure bioterrorism alerts to authorities, first-responders, and others – now serving as a model for other states, p.105.
- Findings on heat-related illness among agricultural workers leading to successful funding of a heat-related illness project funded by the Centers for Disease Control/National Institute on Occupational Safety and Health (CDC/NIOSH), p 127.
- The AgrAbility Program, successfully replicated in Australia and Canada, has served more than 16,000 clients and demonstrated improved client quality of life post-participation in the program, pp. 117-121
- Testing of a new theory of chemical wet finishes to dramatically improve biological and potentially chemical protection of clothing worn by first-responders, incorporated into firefighter's uniforms, and now being tested by the U.S. Air Force, p. 198.
- The collaborative partnership between National 4-H Leadership Trust, including National 4-H Headquarters and National 4-H Council has resulted in over \$57 million being distributed to the states for program development and enhancements in the area of science engineering and technology, leadership development, civic engagement and promoting healthy lifestyles.
- CYFAR grants totaling \$41 million have been matched with approximately 13 million in state and local funding and have contributed to the leveraging of substantial resources for for youth programs from other Federal agencies.
- In an effort to reach rural and limited resource audiences, the Centers for Medicare and Medicaid Services (CMS) partnered with CSREES and Cooperative Extension teams to educate Medicare beneficiaries and their family caregivers about new benefits, helping them make informed consumer health care decisions. The project has reached over 1 million people to date and saved beneficiaries an estimated \$900,000 in Nebraska alone. The project is being considered by CMS for replication nationwide.
- An NRI project, From Welfare to Work: The Effectiveness of Policy in Rural Labor Markets, Oregon State University, studied the effectiveness of public welfare policy in helping families achieve economic self-sufficiency in rural labor markets. As a result, the research team helped Congressional staff and policymakers better understand some of the barriers to work facing low-income adults in rural areas and the differential impacts of welfare reform in rural and urban areas. Research results are being used to develop a policy analysis tool linking alternative policies and poverty outcomes.

Stakeholder/Constituent Inputs

Input by stakeholders and constituents to the 2.2 Portfolio is mandated by statute for at least some of CSREES' federal funding, actively solicited through a number of mechanisms and avenues, and can be demonstrated with specific examples drawn from the Portfolio.

The 1998 Agricultural Research, Education and Extension Reform Act (AREERA) requires recipients of formula funds (Hatch, Evans-Allen, and Smith Lever) to collect stakeholder inputs every year and describe the process used to identify individuals or groups as stakeholders. Each institution needs to describe how these inputs relate to plans of work, priority setting, immediate needs and long-term goals, guidance on monitoring, and proposed research activities. Every Request for Applications (RFA) specifically seeks stakeholder input as per the AREERA requirements (7 U.S.C. 7613(c)(2)). This section requires the Secretary to solicit and consider input on a current RFA from persons who conduct or use agricultural research, education and extension for use in formulating future RFAs for competitive programs.

The National Program Leaders have effective networks and mechanisms that assist them in establishing priorities and assuring the relevance of programs. Both formal and informal procedures are used to obtain stakeholder input. These may include stakeholder workshops, symposia, technical reviews, peer panel recommendation, white papers, CSREES departmental review reports, presidential directives, interagency, strategic plans for research and development, regulatory policies impacting food quality and safety and industry plans and priorities. Feedback from these groups and individuals is obtained directly and indirectly and is used to identify and prioritize national needs to assure the relevance of programs within each portfolio. (See Evidentiary Materials)

During FY 2000-FY 2004, CSREES maintained close involvement with its principal partners and stakeholders through both formal and informal processes. CSREES National Program Leaders actively participate in a myriad of partner workshops or information dissemination sessions which is another valuable source of information. Additionally, active communication is fostered with multiple professional societies and organizations through National Program Leaders' memberships, invited presentations, and formal requests for guidance. National Program Leaders' involvement with multi state committees, as well as competitive peer review panelists and panel managers, and regional grantsmanship workshops provide invaluable feedback and direction. As noted above, numerous national and international scientific conferences, meetings, and sub-committees are attended by one or more members of the agency's social and behavioral scientists which help inform decisions regarding program development. National Program Leaders participate on Federal interagency working groups, committees and task forces which contribute to close linkages with other Federal priorities. Partner strategic plans also are used to align CSREES' efforts.

Specific examples of opportunities for stakeholder input referenced in this document include:

- The NCR-197 Committee on Agricultural Safety and Health established by the North Central Regional Administrators (NRCA), including representatives from 18 land- grant colleges and universities, USDA, the National Institute for Occupational Safety and Health (NIOSH), developed a structure for gathering stakeholder input and identifying and coordinating priorities in the agriculture and health field, p. 128 (See evidentiary materials;
- NCR-52, Family Economics Research Coordinating Committee, framing the research on financial security, p. 80;
- The Road Map for Integrated Pest Management, pp. 98-99;
- Community mapping strengthens public understanding of the priority needs of their own community, p.163;
- NC-170, Regional Research Project, “Occupational Safety and Health Through the Use of Protective Clothing”, p. 185;
- The Extension Committee on Organization and Policy (ECOP) with CSREES to create the Healthy People, Healthy Communities Initiative, p.212;
- The 4-H “National Conversation, p.237;
- The forthcoming 2006 National 4-H Technology Leadership Conference, p. 176.
- The National Center for Housing and the Environment (NCHE) and CSREES established a consortium including multi-disciplinary university faculty that met with members of the Housing Education and Resource Association, to generate research priorities on natural resource and environmental issues intersecting with housing, pp.200-201;
- The Breast Cancer and Environmental Risk Factors (BCERF) program critically evaluated human, experimental animal, and other data in peer-reviewed and unpublished studies on the cancer causing potential of selected agrochemicals and educated policy makers, scientists, environmental groups, and the public. BCERF faculty advised on NIH panels on cancer and the environment, and formative research with teachers identified needs for better cancer information and ways to address cancer risks, p.195.
- CYFAR has 6 liaisons to all 53 CYFAR states and territories who provide feedback to CSREES
- CYFAR annual conference reaches 700 youth and family professionals

Alignment of Portfolio with Current State of Science-Based Knowledge and Previous Work

The alignment of Portfolio 2.2 with the current state of science-based knowledge and previous work is ensured through mechanisms such as competitive awards based on peer review, collaborations with university-based researchers and graduate students, active involvement of NPLs in professional and technical associations and societies and may be demonstrated by specific examples across knowledge areas and disciplines.

As noted in Section I, the competitive review process encourages innovative ideas that are likely to open new research approaches to enhancing agricultural and natural resource management. A proven mechanism for stimulating new scientific research, the process increases the likelihood

that investigations addressing important, relevant topics using well-designed and well-organized experimental plans will be funded.

Research on Geospatial technologies such as GIS, GPS and remote sensing offer tremendous potential for improving community needs assessment and development as well as land use planning and natural resource management, p.251

CSREES works closely with the Family Economics Research Coordinating Committee (NCR-52) to assure research priorities are relevant to policy and education, employ contemporary research methodologies, and draw from well-established theories from relevant disciplines.

CSREES NPLs have developed national multi-institutional committees on Positive Youth Development Research and Professional Preparation of Youth Development Workers to stimulate identification of critical research needs.

CSREES, through its partnership with universities, other federal and state agencies, and private organizations, is contributing to a bank of science-based knowledge through research, education and extension activities. CSREES-funded projects are having significant positive impacts. Improved tracking of research outcomes (i.e., refereed publications, licensed technologies, and patents produced by or referencing work of CSREES-funded researchers and graduate students) will help in subsequent efforts to demonstrate not only alignment, but active contributions to foundational knowledge (as referenced below, under accountability).

Appropriate Methodology of Funded Projects

Funded projects are peer reviewed by each institution and must agree with the Plans of Work that are approved by CSREES (see Evidentiary Materials). All proposals are then reviewed by CSREES and either approved, disapproved, or deferred for revision. All concerns of reviewers must be addressed before a special project is recommended for funding. In some cases, the CSREES project Liaison also solicits ad hoc reviews from authorities outside of the agency to better inform the recommendation.

All competitive projects are/were rigorously reviewed by individual experts and Peer Review Panels for scientific merit, innovation, impact, national significance, and potential for success. Competition is extremely keen.

The resulting use of appropriate and cutting edge methods and materials and techniques for funded projects can be demonstrated by such examples as:

- Projects to provide youth with opportunities to access and develop necessary computer skills, using the internet, web page design, digital video documentary, Lego Robotics, geospatial technologies, and other forms of information technology, p. 64 and p.167;

- Numerous examples of interactive distance learning, including Great Plains IDEA graduate programs in emerging fields such as Youth Development, p. 238 and Family Financial Planning, p. 61;
- Numerous examples of web-based tools and information dissemination, such as CYFERnet, pp. 247-248. CYFERnet is a collaboration of 30+ universities – providing web based resources and education to the system, and 5 editorial boards to peer review new resources.
- Genetic ‘fingerprinting’ of termites, Termites cause over \$100 million in damage to household structures in Hawaii, and over 2 billion to structures across the U.S. Researchers in Hawaii applied molecular genetic techniques, including DNA fingerprinting, to follow the path and spread of termites from one location to another. By observing the "barcode" of DNA, the researchers could define the boundaries of a termite colony and monitor the spread of toxicants throughout the colony. Companies that manufacture termite baits can now require that infestations be sampled for DNA fingerprinting once bait is applied for control purposes, ensuring that new pesticides work to control termites and that baits are being applied properly, pp. 101-107;
- Efforts to lower the cost of high-speed Internet transmission, p. 174;
- Investigation of transgenic cotton’s fiber strength and cell development, resulting in possible nanoporous structures inside fibers, a basis for nano- and biobased materials, p. 187;
- A cloth-dyeing technique using nanotechnology being patented by UC Davis, p. 188.

PERFORMANCE

The performance of the programs funded in this portfolio can be assessed in several dimensions, which, when combined, suggest that overall, the programs are advancing the knowledge and application of science for the improvement of health and quality of life in rural America and across the nation.

Portfolio Productivity

The Portfolio 2.2 area previously described demonstrates various research, education and extension outputs and outcomes. Taken as a whole, it is the assessment of the Portfolio NPL Team that considering the limited resources actually available for such a broad area that covers research, education and extension activities for health and quality of life issues, this portfolio of work is very productive. The outcomes and impacts highlighted in this document, along with the evidentiary materials, provide very strong evidence of excellent productivity with the managed and leveraged resources.

Assessing the productivity of competitively funded programs is relatively straightforward, in that annual and final reports are required in CSREES' electronic Current Research Information System (CRIS) and the CYFAR online database. This is also true for formula research projects, and special research grants. The assessment is more difficult with formula extension programs,

in that states exercise wide latitude in what they report. Because CSREES is a minority funder in most states, the number and quality of annual reports vary from those states that report everything regardless of funding source to those who report just those programs that are “touched” by CSREES funding. CSREES is confident that the quality of life impacts are high (examples are reported in this document).

At the national level, the current system provides an incomplete and unsystematic picture of the gamut of results and impacts that emerge from CSREES-funded extension programs. Beginning in 2000, CSREES and land grant partners have six national committees working to identify consistent agreed-upon program goals, impacts and evaluation methods for work in parenting, youth and child care, financial security, housing and the near environment, healthy life styles and community nutrition. Extensive research/situation summaries, logic models and impact evaluation methods are available on a partner’s university website for use by the entire system. The next plan of work cycle will incorporate the outcomes of these committees and vastly improve the consistency of reporting. The agency currently is developing a mechanism which will utilize these efforts to strengthen the collection of extension information. Moreover recent large-scale evaluations of such long-standing CSREES programs such as the 4-H youth development program provide data that support the position that the program helps youth develop and use life skills.

Programs coordinated nationally by extension, generally in partnership with other organizations (e.g. NEFE® High School Financial Planning Program®, America Saves) have built-in processes for gauging productivity.

Portfolio Comprehensiveness

Programs in this portfolio meet their intended outcomes at the individual project level, as well as at state and institutional levels where broad guidelines and discretions are provided to states through formula funds. In the Knowledge Area descriptions (such as the Outcomes and Success Stories sections, as well as the evidentiary materials), ample evidence is provided that documents achieved outcomes. The principal limiting factor to CSREES' ability to have an even greater impact in improving human health and health and quality of life in rural areas through research, education, and extension is primarily an issue of budget appropriations for this area.

The program toolkit for Financial Security in Later Life, an extension initiative, was continuously expanded until all areas of concern to learners were covered. Educational programs address overall financial planning, saving, investing, decisions about long-term care, legal issues, and wills and estate planning.

Portfolio Timeliness

Assessing the timeliness of the work in this portfolio is largely done by monitoring the submission of final reports or requests for renewal, extension, or budget carryover. These determinations are relatively easy to track for competitive grants and special grant projects where

formal proposals and annual reports are due. With competitive funds, timeliness is maximized since renewals are not possible until the original award is complete. Additionally, every new NRI competitive proposal that is submitted is required to include a one page progress or termination report for all NRI competitive grants received by the submitting project director in the previous 5 years. If productivity and timeliness have not been strong, review panels will not recommend additional funds until the situation is corrected. Also, NRI Coordinated Agricultural Projects are funded as continuation awards, so that they do not receive the next year's budget until their previous year's progress has been evaluated by Stakeholder and Scientific Advisory Boards and approved by CSREES. CYFAR projects require approved year end reports before renewal applications are reviewed. Currently CYFAR has 100% compliance.

Assessing the timeliness of the work accomplished through formula programs, particularly extension programs, has inherent challenges. Research projects have discreet start and completion dates; extension programs may have semi-discreet start dates, but often do not have a completion date, due to the iterative nature of education, which is rarely "completed." What can be assessed, in place of timeliness, is extension program evolution. As issues change and new knowledge is gained, extension programs are continually evolving in order to incorporate new considerations. This is monitored, in part, through the state Annual Reports which are now reviewed by a cadre of 100 National Program Leaders (two assigned for each state). The new State Plan of Work System should make progress easier to track.

Extension programs continually evolve to meet needs. For example, future directions focus on education for bankruptcy filers resulting from the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) of 2005, effective October 17, 2005.

Agency Guidance Relating to Portfolio

The agency provides guidance in the conduct and assessment of programs through several mechanisms:

- Requests for Proposals - Project Directors of funded projects are expected to fulfill the project objectives and to provide annual progress reports and final reports. The requirements that must be fulfilled by the Project Director are clearly spelled out in the Terms and Conditions of the award document that is sent to the performing institution. In this way, CSREES ensures that funding recipients clearly understand their obligations.
- NPL Management and Leadership - NPL's are responsible for portfolios of work within specific disciplines, funding sources and functions. Within their sphere of influence, NPLs interact with multi-state research committees, interagency working groups, ad hoc program committees, strategic planning efforts and other venues with the university and industry communities. Part of this interaction involves conveying agency needs and expectations regarding the funding that is provided. This is usually more relevant to formula-funded programs, as competitive grant recipients have formal obligations to complete project objectives for which they were funded.

- CSREES Website – CSREES re-designed its website in 2004 and information is now easier to retrieve, including timely updates and summarizes of all agency funding opportunities from one "funding opportunities" page.
- NPLs provide national leadership to the development of national conferences in their fields of interest
- NPLs convene monthly audio and video teleconferences to bring about multi-state sharing of successful practices and problem solving.
- CSREES assigned agency liaisons to all multi-state research projects aligned with the portfolio. These include projects focused on home-based business and the effects of welfare reform on rural America. Liaisons monitor the work of the research teams, recommend additional funding sources, and provide visibility for the results.
- NPLs manage electronic communications, such as news bulletins and announcements of funding opportunities.

Examples of the various forms of agency guidance are contained in the Evidentiary Materials.

Portfolio Accountability

The work accomplished in this portfolio is monitored by NPLs who either manage competitive grant programs, serve as agency liaisons for special grants, multi-state committees, interagency working groups, etc, or review state annual reports.

The Current Research Information System (CRIS) system is an informational resource that allows NPLs to track the progress of research and, more recently, education programs. Though not designed to fulfill all accountability purposes, CRIS is accessed by NPLs to determine if projects were completed as funded, requests for extensions and budget carryovers are justified, and progress reports submitted prior to approving requests for renewals. The agency also initiated a policy that prohibits a project director from receiving another competitive award if she/he has an outstanding CRIS termination report for another agency project. This system of checks and balance helps catch projects that are slow in their reporting.

Formula-funded programs are evaluated on a state-by-state basis by a two-member NPL Review Team. These reports are examined for completeness, evidence of impacts, and stakeholder involvement. NPL reviewers are responsible for the entire state report, regardless of the expertise of the NPLs. A written assessment is completed and returned to each institution. In the event a report has deficiencies, the Lead NPL communicates those deficiencies and awaits additional documentation before proceeding with the review and release of funding. CYFAR online reporting system provides feedback and approval to all projects. Data is available on a public data site.

All agency multistate committees are monitored using a national database, the National Information Management and Support System (NIMSS: http://lgu.umd.edu/lgu_v2/) that comprehensively collects all relevant accountability information including: History ; Statement

of Issue(s) and Justification; Related, Current, and Previous Work; Objectives; Methods; Measurement of Progress and Results; Participation; Outreach; and Meeting Information, Participants Directory, Publications, and Minutes.

CSREES is also in the process of designing new processes and tools, particularly monitoring and evaluation systems, and training the agency's partners in their use. Examples include the new State Plan of Work Reporting System and the "One Solution" database under development. Currently, it is difficult to track research outcomes such as licenses, patents, etc. This system will ease reporting and tracking. In an environment in which funding support at all levels is becoming tighter, any activities that strengthen accountability and impacts will likely have greater funding support. This is true of the President's Management Agenda and OBM results-based budgeting processes.

CSREES program leaders focus on accountability reporting for such programs as Financial Security in Later Life, America Saves, Financial Education through Taxpayer Assistance, and Healthy Indoor Air Quality and First Time Home Buyers. Impact reports show significant economic and environmental relevance to families and communities.

NPLs encourage successful programs to prepare exhibits for sharing of proven practices at national and international organization and industry meetings.

Acronyms and Translations

Acronym	Translation
ACF	Administration for Children and Families
Ag	Agriculture
AREERA	Agricultural Research, Education and Extension Reform Act
ARDS	Arbovirus Rapid Deployment System
ARS	Agricultural Research Service
ASAP	Army Substance Abuse Program
ASEC	American Savings Education Council
ATV	All-terrain vehicle
BPI	Budget and Performance Integration
BCERF	Breast Cancer and Environmental Risk Factors
BSF	Building Strong Families
CBDD	Center to Bridge the Digital Divide
CEDA	The Council of Entomology Departmental Administrators
CDC/NIOSH	Centers for Disease Control/National Institute on Occupational Safety and Health
CES	Cooperative Extension System
CFSC	Community & Family Support Center
CRIS	Current Research Information System
CRN	Community Readiness Networks
CSREES	Cooperative State Research, Education, and Extension Service
CYFAR	Children, Youth, and Families at Risk
DVR	Wisconsin Department of Vocational Rehabilitation
EDEN	Extension Disaster Education Network
EFNEP	Expanded Food and Nutrition Program
EIRP	Extension Indian Reservation Program
ENOR	Eagle's Nest/Owl's Roost Environmental Discovery
EPICS	Engineering Projects in Community Services
EPA	Environmental Protection Agency
ERS	Economic Research Service
ES	Easter Seals Central Pennsylvania
ESCOP	Experiment Station Committee on Organization and Policy
FAEIS	Food and Agricultural Education Information System
FAP	Family Advocacy Program
FARM	Wisconsin Farm Assessment and Rehabilitation Methods program
FFA	Future Farmers of America
FLEC	Financial Literacy and Education Commission

FSL	Financial Security in Later Life
GAO	Government Accountability Office
GIG	Government Interagency Group
GIS	Geographic Information Systems
GP-IDEA	Great Plains Interactive Distance Education Alliance
GPS	Global Positioning Systems
HE	Human Granulocytic Ehrlichiosis
HF	House Flies
HIS	Hispanic-Serving Institutions
HO	Hazardous Order
HOSTA	Hazardous Occupations Safety Training for Agriculture
HSFPP	High School Financial Planning Program®
ICT	Information communication technologies
ILN	Intel Latino Network
IPM	Integrated Pest Management
ISE	International Science and Education Grants
ISU	Iowa State University
IT	Information Technology
JITP	“Just in time parenting”
KA	Knowledge Areas
LEAP	Louisiana Educational Achievement Program
LIFE	Living Interactive Family Education program
LK	LifeKnowledge
N4-HYTLT	National 4-H Youth Technology Leadership Team
NAGCAT	North American Guidelines for Children’s Agricultural Tasks
NAP	National AgrAbility Project
NASULG	National Association of State Universities and Land-Grant Colleges
NCR-52	North Central Regional Research Coordinating Committee
NEFE	National Endowment for Financial Education®
NEMO	Nonpoint Education for Municipal Officials
NIOSH	National Institute for Occupational Safety and Health
NPAL	National Planning and Accountability Leaders
NPL	National Program Leaders
NRCA	North Central Regional Administrators
NRCS	Natural Resources Conservation Service
NRI	National Research Initiative
OJT	On-the-job training
OMB	Office of Management and Budget
OMK	Operation: Military Kid

P&A	Planning and Accountability
PADN	Plant and Animal Diagnostic Network
PART	Program Assessment Rating Tool
PMA	President's Management Agenda
POW	Plans of Work
PREP	Portfolio Review Expert Panel
PSU	Pennsylvania Cooperative Extension
REEIS	Research, Education and Economics Information System
RFA	Request for Applications
RI	Related instruction
RME	Risk Management Education
RPS	Research Problem Areas
RREA	Renewable Resources Extension Act
SAES	State Agricultural Experiment Stations
SARE	Sustainable Agriculture Research and Education Program
SBIR	Small Business Innovation Research
SERD	Science and Education Resources Development
STRUT	Students Recycling Used Technology
TTIS	Teens Teaching Internet Skills
UDLL	Universal Design Learning Laboratory
USDA	United States Department of Agriculture
WNV	West Nile Virus
WMS	Washington Manufacturing Service
WSU	Washington State University
ZTN	Zama Teen Network